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It's the best selling weekly

Vol 4 No 21

Atari offers 520 ST in three versions

ATARI has now confirmed its pricing plans for the 520ST

Initially the machine will be sold in a bundled package, comprising the 520ST cpu 1 M disc drive and a high resolution monochrome monitor, which will retail for £899 90.

The company has also now affirmed that the 512K 520ST model is the only ST machine the company will be marketing (see *Popular Computing Weekly*, May 16) Two other ST models announced earlier this year by Atari – the 256K 260ST and the 128K 130ST will not now be manufactured

However, Atari is eventually planning to sell the 520ST in three different packages The first batch of final production machines, at £899 90, will probably now reach the shops in September Shortly afterward, Atari intends to offer a second package comprising the 520ST with the 1 M disc drive, but no monitor, for £699 While the first version did not contain a modulator, this second version will have one built in, and can thus be used with an ordinary domestic television

The third package will probably not appear this

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Japanese turn to compact discs

SEVERAL of the major Japanese electronics companies, including Sony, are developing versions of their compact audio disc players for use as microcomputer data storage devices

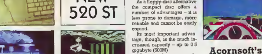
The eventual intention is to develop a single compact disc player that will handle both audio and compact discs

As a floppy-disc alternative the compact disc offers a number of advantages – it is less prone to damage, more reliable and cannot be easily copied.

Its most important advantage, though, is the much increased capacity – up to 0 5 gigabyte (500M)

"Sony has been researching into the use of the compact disc for a long time," said Mike Margolis Sony UK's MSX product development manager 'Virtually since CD first appeared, we have been looking into the possibilities of digital data storage on it It has advantages of reliability, and room – you can get half a gigabyte on each disc We have made prototypes of CDs as data

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Acornsoft's REVS see page 45

INSIDE ❯ NEW ENTERPRISE 128K MICRO – PRICE OETAILS ON P4 ❯


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View

News that the Japanese electronics giants are developing compact disc players as a means of mass computer software storage is intriguing

At present floppy disc drives can maybe store 1 megabyte of information. A typical hard disc unit may store 10M. Now here is a system capable of quickly and reliably storing and retrieving around 500M, on a disc costing about £10

Admittedly it will be several years before such a system will be available. Also, the first generation of CD computer software players will not be able to run audio discs, you will need to buy a special CD player

Yet, in the slightly longer term CD storage will revolutionise computing. The ultimate goal of the Japanese manufacturers to incorporate the micro as part of a complete home entertainment centre comes a step closer. With CD software the micro becomes part of a racked system incorporating a hi-fi, video, television and radio. Just as you might play a disc of Springsteen, so you could slot in and play a computer game, several megabytes in size, looking more like an interactive film than *Space Invaders*

In such a system the concept of 'computing' disappears. Writing a program of comparable quality with commercially produced efforts becomes as difficult as it now would be to make a video film

Already most home users are now disappointed at their own attempts when compared with those of the 'professionals'

Soon there will be no need to know what goes on under the bonnet of your computer. There will be no need to learn Basic or machine-code – in order to drive it

POPULAR Computing WEEKLY

Vol 4 No 21

Presents . . .

Futures . . .

Lunar Lander on the Amstrad. . Otto – Star Game for the Commodore 64

Editor David Kelly **News editor** Christina Erskine **Features editor** Graham Taylor **Software editor** John Cook **Staff writer** Martin Croft **Production editor** Lynne Constable **Editorial secretary** Geraldine Smyth **Advertisement manager** David Lake **Assistant advertisement manager** Jeremy Kite **Advertisement Executive** Diane Holyoak **Classified executive** David Osen **Advertising production** Lucinda Lee **Administration** Theresa Lacy **Managing editor** Duncan Scot **Publishing director** Jenny Ireland **Published by** Sunshine Publications Ltd 12-13 Little Newport Street London WC2H 7PP Tel 01-437 4343 Telex 296275 **Typeset by** Publishers Reprographics Services Ltd 4 Roger Street, London WC1 **Printed by** Greenaway Harrison Sutton Road Southend-on-sea Essex **Distributed by** S M Distribution London SW9 Tel 01 274 8611 Telex 261643 © Sunshine Publications Ltd 1985

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Computer Trades Association Magazine of the Year

Enterprise 128 vies with QL

ENTERPRISE launched its 128K machine this week, at a price of £249 95 At the same time, the price of the 64K model will fall to £179 95 Limited quantities of the upwardly compatible 128K model should now be in the shops, while it is not expected to be available in volume until mid-June

"I don't believe there is anything else around to challenge us on quality and price – it's going to be a 128K Christmas," said Enterprise commercial director, Mike Shirley "It significantly outperforms machines such as the BBC B Plus and the QL at almost half the price "

Based on the Z80 chip – the same as the Enterprise 64K – the 128K capacity is achieved by switching in different 16K blocks of Ram. Using the same mechanism, Ram can be expanded up to 3 9M

Enterprise plans a disc drive controller to be available for both the 64K and 128K models in time for Christmas Also, between now and Christmas more than 100 software titles are scheduled for release, again for both models

Although the company has so far only sold "just under 10,000" of its 64K model, it is predicting combined sales of the two models to top 150,000 in the UK by Christmas with a further 200,000 being sold overseas

Compact discs

◄ continued from page 1

storage systems, but anything finished is a very long way off '

Mitsubishi's product manager Steve Wankling confirmed that compact discs presented an attractive means of data storage "It would be very feasible," he said "Access time would be particularly quick Before one could be manufactured for MSX, though, obviously we would have to come to an agreement with Ascu Microsoft as to a standard for all the group "

It seems that the first such CD data storage devices will not be capable of also playing audio discs An interface would need to be developed that could extract data digitally from the disc Sony's research regarding software at present has concentrated on solely digital CD players.

Nevertheless the long-term aim is to develop one system for both software and audio use

BBC B+ meets caution in High Street

ACORN S new BBC B+ has met with a guarded reaction from the multiple retail outlets

Although Acorn had built up large quantities of the new machine prior to its launch, three weeks ago, it is still very difficult to buy one in the shops

"The High Street is still making decisions over whether or not to carry the machine,' said an Acorn spokesman "After all, it is intended for the professional home market and for educational and small business use rather than as a hackers' machine "

And while Acorn expects the B+ to become available in a wide range of independent stores the major outlets are treating it with caution.

"We are not taking the B+ at the moment," said Peter Frost of Boots "At £499, it is not really viable for Boots' range. We are, however, continuing to stock the BBC B with disc interface at £398, but not the model without "

Dixon's, Lasky's and WH Smith's also confirmed that they had not yet made up their minds over the B+ Dixon's and Lasky's are both currently selling a discounted model B at £349 99 (Dixon's) and £349 90 (Lasky's) Dixon's price includes a data recorder, Lasky's a data recorder and software

CPC464 Roms released by Micro Power

MICRO POWER, the software company best known for its BBC programs, is bringing out a Rom card for the Amstrad 464 next month.

' The card fits into the expansion port on the machine, and can carry up to seven Roms," said Bob Simpson of Micro Power "It also comprises an extension bus, so that peripherals which would normally use the Amstrad expansion port can slot into the back of the Rom card. It can also chain additional Rom cards "

At the moment the Rom card can only be used with the 464 model, but this is due to the card not fitting on the back of the 664, rather than a question of software compatibility Micro Power is working on a version for the 664

Kempston to develop QL's first mouse package

KEMPSTON is working on a series of interfaces for the QL including the first QL mouse and mouse interface, a disc interface and a sophisticated Centronics interface

Details on the mouse are still to be finalised, but Kempston hopes to bring out both the mouse and interface in a single package, including software, for around £100 within the next two months

The disc interface will work with any disc drive, whether 3 inch $3\frac{1}{2}$ inch or $5\frac{1}{4}$ inch.

Its software has been written by QDOS author Tony Tebby, so compatibility with the QL's operating system is assured The interface fits inside the QL casing and costs £115 00

The Centronics interface plugs into the Rom cartridge port, and has been designed to operate with any printer "The on-board Rom allows screen dumps on nine different types of printer, including ink-jet and full colour, but it can be adapted to work with any others,' said Ab Pandaal of Kempston.

Kempston will be showing the new interface at CES at the beginning of June

Atari 520 ST – three versions

◄ continued from page 1

year, but will add a colour monitor to the second package and retail at around £900 The colour monitor will have a lower resolution than the monochrome monitor

There are currently about 40 520ST models in this country, which are being delivered mainly to software houses

These machines all have the firmware on disc, rather than in Rom, as is planned for the machines that will be sold in the shops

Any further additions to Atari's ST range now look like being bigger memory versions – 1 M Ram and upwards – of the ST rather than cut-down models

Games Workshop backs off

GAMES Workshop, which moved into the software market last autumn, is pulling out again, informed sources suggest.

Angus Ryall, Software Marketing Manager, would not comment except to say, "We would not normally be doing things at this time of year anyway – there is a possibility of releasing more stuff in the autumn."

But Workshop employees have been told that further software releases are unlikely due to distributors' overstocking at Christmas and the influx of American software – "the American stuff has cleared up the market," Angus Ryall claimed.

Angus Ryall

Attempts are being made to sell at least one game which was planned for release to another software house. This is *Kenestone*, which combines a *Lords of Midnight* style graphics adventure with a full sentence parser text adventure.

Other games and conversions are apparently being shelved indefinitely – including *QLD-Day* and the planned Judge Dredd arcade game, announced a fortnight ago.

Basic computer for Spectrum from OCS

OXFORD Computer Systems, the company which specialises in high-level languages on home computers, is bringing out a Basic compiler for the Spectrum.

Called *Blast*, it will compile all Spectrum Basic programs, line by line, leaving programs which will run independently of the compiler program. *Blast* is being released this week, on cassette at £24.95.

DK'Tronics Popeye and Hagar out soon

DK'Tronics' *Popeye* will finally be launched in about a month, after being completely rewritten.

The company is also working on an arcade title based on another cartoon character Hagar the Horrible.

The original version of Popeye, which should have been launched at the end of last year, was shelved. "It wasn't really good enough, so we scrapped it – there just wasn't enough depth," according to Neil Rawlinson, DK'Tronic's company secretary.

"We couldn't let a licensed character of the stature of *Popeye* go out unless it was a blockbuster game," he said.

The version due for release soon is completely different from the first try. *Popeye* mark 2 is being written by Don Priestly, the programmer responsible for *Minder*.

"It's a very visual game – nothing like *Minder* at all. It departs from the standard format because the central character is so large – Popeye is 11 characters high, which is about a third of the screen."

The screen is made up of three layers, which means that Popeye can walk in front of and behind objects on the screen, as well as bumping into them.

It is "part arcade and part adventure" Don Priestly said, and will feature Bluto and Olive Oyl.

Don is also working on an arcade game based on the *Hagar the Horrible* cartoon character, which is likely to be released in about two months.

Both games will be for the Spectrum 48K, Commodore 64, Amstrad, MSX and "probably Atari and Memotech", stated Neil Rawlinson.

No price has yet been fixed, but it is probable that both *Popeye* and *Hagar* will sell for considerably less than the £9.95 that *Minder* cost.

THE COMPLETE ARCADE ADDICT'S GUIDE

The next feature issue of *Popular Computing Weekly* is all about arcade games. As part of that issue we want to compile the biggest collection of arcade game hints, tips, tricks, infinite lives pokes, get to any level cheats, redesign sprites, secret programmer's chat you've discovered, bizarre bugs etc, etc about absolutely any arcade game.

If you know anything about any arcade game that might be useful or interesting to other arcade addicts we want to know.

Keep your information as brief as possible and fill in the form below.

ACCURACY

Please double check any Pokes/lines of Basic included in your tip. We won't have time to double check everything and a tip that doesn't work is worse than useless. Also note down if your Poke/whatever only works on some versions of the game.

REWARD

Anybody who sends in a tip (that works), even if we already have it, will be entitled to buy any of the Sunshine books listed below for a mere £2.00, saving pounds on the cover price. Just fill in your tip(s), indicate the books you want, enclosing a cheque for the appropriate total made payable to Sunshine Books. Send the lot to *Popular Computing Weekly*, Arcade Tips, 12-13 Little Newport Street, London WC2H 7PP.

Choose any book on this list for £2.00:

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Game Title: ....

My Tip: ....

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Book: ....

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Letters

Round the bend?

Who are Acorn trying to kid? £500 for a 64K micro – they must be absolutely round the bend.

This is what the Model B should have been back in the heady days of 1981 when a Commodore 64 was £349 + VAT and Clive had just launched the Spectrum.

Now in AD1985, 64K is the norm and by the beginning of next year it will only be half enough to fully satisfy people in all seriousness, how many B + s do Acorn expect to sell in competition with £200 for a Commodore 64? Amstrad throws in a monitor and still costs below £400, and – ultimate highlight of Acorn's folly – a 128K Atari machine sells for £170 Think about it – the Atari has twice as much memory but you can buy three Ataris for the price of a B + My simple northern logic tells me Atari are going to flatten Acorn in the sales stakes

Little wonder Acorn got into financial difficulties. I can't believe they have been selling many machines at those ridiculously high prices. Olivetti may yet regret purchasing 50% of Chris and Hermann's little company

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Mixed feelings

I couldn't help reading James Lucy's *Ziggurat* article (May 9) with very mixed feelings

Firstly I had to agree wholeheartedly with his observations regarding the all too frequent demise of the specialist computer outlet willing to dispense valuable technical advice I bought my machine from a high street multiple and am greeted with blank stares from the 'assistant' whenever I have any queries

But Mr Lucy's closing comments about Amstrad computers being aimed at "the lorry driver and his family" raised my hackles. The CPC 464 and 664 do use established and proven technology However, the design philosophy and implementation were a considerable advance on existing home computers Locomotive's Basic and the operating system were given a " software of the year, 1984" award for good reasons The information available to Amstrad users from the very start has set a standard that other manufacturers have yet to reach. The CPC 464 has been called a "hacker's delight" I have yet to hear appreciation expressed for the hardware implementation and documentation of the QL the "cutting edge of technology" (sic) I understand that the first release of the 16-bit Atari ST range featuring Gem will have a large proportion of the operating system on disc in order that the 'true enthusiast' will have the opportunity of debugging the software so that it will eventually be implemented on Rom, unlike the Sinclair system of releasing Eprom upgrades

I would suggest that the philosophy behind MSX and its ilk is more deserving of Mr Lucy's observations than Amstrad's approach, which has future expansion in mind When 16- and 32-bit technology has matured to the level that now exists for 8-bit machines, manufacturers who implement the same approach as Amstrad's will enjoy the same appreciation of enthusiasts that the 464 and 664 have today

A distinction must be made between those of us interested in programming and those interested in electronic projects. Purchasing printers, modems and disc drives as off the shelf add-ons that integrate with the system enables the enthusiast to take advantage of proven advances in technology immediately without the need to design and implement hardware at unnecessary extra cost

He's sulking!

In reply to BA Pedder's letter in the same issue, there is no bug in 464 string handling as the documentation illustrates and specifies the format produced by the STR$ function as including a leading space for representing the sign of the number It refers to the PRINT format specifically DEC$ can be used in the form.

DEC$((<numeric expression> <format template>)

Note the two opening brackets. This rather odd syntax is a bug Amstrad freely admits to An undocumented housekeeping bug which has been removed from the 664 operating system occurs in *Auto* mode The line number produced in *Auto* is not entered into the line buffer until *Enter* is pressed hence if the line is 256 characters long, the trailing characters will be truncated by the length of the line number and a space This of course is only detected on either RUNning or LISTing Be warned

Rob Baxter
60 Milton Grove
Whalley Range
Manchester M16 0BP

James Lucy was only paraphrasing what Alan Sugar, Managing Director of Amstrad said himself – that Amstrad computers were aimed at "the truck driver and his wife".

A passsing interest

Further to my letter published in the May 2 issue I would like to put your comments into perspective

Your circulation figures of 56,052 indicate that, (assuming that 'several hundred' means, say, 500 people) 0 89% of your readers have a passing interest in the Sinclair C5, but only perhaps, if they are free, ie, given away as a prize

Go on, admit it, less than 1% want one, even if you give it away Please abandon Sir Clive's Carriage in favour of computers, for the benefit of the other 99 11% of your readers!!!

Malcolm S Collins
7 Heath Drive
Chelmsford
Essex CM2 9HA

Farewell PiMan

Farewell to the Pi man,
Fat happy pink rye man,
With a nose like a tie man,
That kept PCWer's hi man.
So say goodbye with a tear
and a sigh
To the great back page and
the funny pink Pi.

J K Martin
120 Forest Road
London E8 3BH

A new home

"Who was the PiMan Daddy?", "Where has he gone?", "Why has he left the back page?", "Has Automata gone bust?" These are just some of the hundreds of questioning letters and telephone calls we have had from around the world, since the PiMan left his customary spot, on the back page of *Popular Computing Weekly*

The PiMan and "Chums", as Uncle Arnold would say, are, much to the surprise of others, well and still very much in business with new titles under development

Automata is primarily a mail order software house. This means all advertising must pay for itself!

For over two years we ran the back page cartoon strip with *Popular Computing Weekly*, as an advert This meant we paid for the page, Gremlin to draw it and our time to write the scripts Twelve months ago, you, the readers, started treating the back page as editorial Mail order sales dropped so dramatically that we asked *Popular Computing Weekly* to help carry some of the costs. Alas, things have not worked out It would seem that PiMan must look for a new home.

The PiMan will return!

Christian Penfold
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Legend is the only company I can think of at the moment that manages to be both famous and infamous at the same time I would describe the credibility history of the company roughly like this *Valhalla*, two steps forward, *The Great Space Race*, two steps back Now we have *Komplex* and I'm pleased to say it's at least 1½ steps forward again.

Komplex is not, in any significant way an adventure – it looks vaguely like *3D Battlezone* but it's better than that Call it an abstract arcade game that could last for a couple of hours in play

It works like this two thirds of the screen displays a three dimensional view of the decks and levels of an alien world. In this world are scattered letters of the title K,O,M,P,L,E,X You must locate each letter and place it in the central control computer

Moving from level to level takes place via a tube which is protected by various devices. Other devices on each deck drain power from you.

You could say *Komplex* is a 3D collect and dodge type of game but that's to denigrate it The strategy elements of the game are fairly sophisticated and you don't just blast and blast – there is no question of three lives here

But the most impressive thing for me is the look of the game The landscape where all this action takes place is genuinely strange and alien What you see, as you move around this world (in excellent hi-res scrolling perspective), are rectangles in the middle of nowhere, curious spindly poles, sudden holes in the ground, dream-like floating geometrical aliens and the fact that it's all in black and white just adds to the faintly mathematical and disturbing effect

Komplex is a truly imagination gripping game, something that cannot be said for many others You'll need to map its world if you're going to stand any chance of locating the letters and finding your way through the service tubes to the CCC It's mostly brains, not brawn, that's required


BOSS
Start a business and learn about balance sheets, profit, cash flow, bank loans
ENTREPRENEUR
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FORECASTER
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NUMBERS AT WORK
Discover the constellations and learn the secrets of your universe
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Muddy waters

***Martin Croft** talks to Simon Dally about his interactive adventure being launched by British Telecom later this year*

Few computer literates can have survived the last 12 months without having heard of *MUD* – Multi User Dungeon – the play-by-modem interactive adventure game

MUD is already running on the Componet database and now, through a licencing deal with British Telecom worth well into five figures, it will be available to ordinary phone users in an enhanced form – *MUD 2* – before the end of this year

Simon Dally is the man largely responsible for *MUD*'s new-found recognition. He was senior editor of Century Communications when the game s two authors Richard Bartle and Roy Trubshaw, decided to go commercial after four years of running *MUD* on the University of Essex computer Simon saw the potential of the game and signed a licensing deal for Century.

Now Simon Dally is managing director of Multi User Entertainment, a new company set up specifically to develop and market games like *MUD* Bartle and Trubshaw are directors, and the firm has financial backing from Century

The heart of *MUD* is the database, which runs on any mini computer Players can access that database via their modems, turning their micros into remote terminals for the mini. They can then communicate with the game by typing in the standard range of commands that can be found on just about any adventure game

But the important thing about *MUD* – what makes it unique, certainly in this country, and possibly the rest of the world as well – is that more than one player can take part at the same time This means that characters in the same area of the Land of Mud can talk to each other, even though the actual players may be hundreds of miles apart.

In addition, certain of the puzzles within the game require co-operation between players The most obvious example is the getting the crown, the most valuable treasure in the game It is hidden in the swamp, which is a maze But the usual method of solving mazes – leaving objects in each location so as to be able to tell them apart – won t work as inanimate objects sink into the mud.

The only objects which do not sink are people – other players' characters So to solve the riddle of the swamp, a group of players must act together

Of course, only one of them can score points for the crown – but then, diplomacy is half the fun of the game.

Treasure is important because players score points for it. The more points scored, the higher up the status ladder the players climb. The ultimate objective is to reach the exalted rank of Wizard – which enables you to have enormous fun teasing less powerful players

Up until the time Simon Dally left Century, his career was moving along conventional lines After leaving Oxford University he joined Weidenfeld, the publishing house and after 18 months was given the editorship of their books list covering sports, games and leisure His publishing philosophy is simple

"It doesn t matter what books you do, it's how you set about marketing them."

Simon then moved from Weidenfeld to Harrap, where he was in charge of their general books list Later he went to Century to edit computer books

But while Simon was moving up the publishing ladder, his real interest lay elsewhere – with games

"I've always been a games player – bridge and chess to begin with, then *Diplomacy* in the mid seventies, at the same time as Richard Bartle was running his diplomacy magazine, *Sauce of the Nile*"

He became interested in micros pretty early on "I had an Atari games console imported from the States in 1978 before they were available here "

His first professional involvement in computing came when a fellow editor at Harrap went to Addison Valley to set up *Acorn User* – Simon was asked to invent a competition for the first issue and he has been setting the puzzles for the magazine ever since

Simon now has three micros – a BBC B, a Tandy Model 3, and a Tandy Model 100 which sits on his desk at work With an acoustic modem, he uses the Model 100 for all his business needs.

"I came across *MUD* because all the teenage authors I was seeing at the time were talking about it.

"I must admit that I had no idea *MUD* would attract as much publicity as it did last year – I hadn't even played it when I signed up Richard Bartle "

Multi User Entertainment was set up because, as Simon says, "It dawned on me that the only way to get *MUD* off the ground was to create a company for it

"Century did a lot to help set the company up, and are shareholders along with myself, Richard and Roy

"*MUD* is still the best game of its kind – and *MUD 2* will amaze the world," says Simon

The present *MUD* contains about 400 rooms, but the new one will have around 1,000 The idea, according to Simon Dally, is to have some 10 rooms for each player – so *MUD 2* will be able to handle up to 100 players at the same time

Another difference is in the mobiles – that's the term used to refer to the wandering monsters that can be found in the game In *MUD* they just run around being general nuisances and giving players the opportunity to pick up some more points (if they are brave enough!)

MUD 2's mobiles, however, will be far more powerful, and will also be given artificial intelligence, so that they will act in much the same way as player characters This means that you will be able to talk to them, trade with them, even ally with them. Obviously, this opens up far more possibilities

MUD 2 will be launched in September and British Telecom will initially be running the game with 36 lines, increasing to 100 when demand justifies,

If you want to play *MUD 2* you will need to register with BT and get a modem. Baud rate will be both 1200/75 and 300/300 The game will be running between 6.00 in the evening and 8.00 in the morning – basically during the slack period outside the business day As such BT are very keen on the idea – it maximises the use and profit of their own minicomputers

To register, you will have to buy a *MUD* starter pack. (This will probably be called a MUD Pack!) It will contain an introduction to the game, a rule book, a map of *MUD*, and a certain number of free credits The packs will sell for around £20 00

Once the initial free credits are gone, the cost of the game will be approximately £2 00 per hour

"It's a big step to take the plunge and become your own boss, but I'm fascinated by what I'm doing now – it's akin to setting up my own publishing company," Simon says

"I know the BT venture is just the start of something truly enormous "

The Mac-buster?

***Jeff Naylor** previews this year's most eagerly awaited machine – the Atari ST*

At the beginning of the year, Jack Tramiel announced the ST range, with the basic model, the 130ST, costing just $399. The intention was obvious to make a machine that would be as good, if not better than, the Apple Macintosh The same microprocessor, Motorola's 68000, is at the heart of the ST design and it sports a mouse with Gem, Digital Research's icon-driven menu operating system

Although the Macintosh is a highly desirable computer, it is priced well above the level which the average home computer user can afford. If the price of the ST is low enough, personal and business computing will merge into one

So much for the hype Does the Atari ST really promise to move home computing up into the big league? Since January the 130ST has been dropped in favour of the more expensive bigger memory 520ST model So far there are no more than a couple of pre-production machines in Europe The machine previewed here is one of these, a 512K 520 ST that had spent the last few weeks on a grand tour of the continent Although well advanced on the hardware side, the system software for the micro was – on the evidence of this machine – still far from completion.

Hardware

The ST occupies a good deal of desk space, it is nearly two feet long and nine inches deep, even bigger than an Amstrad 664. Yet styling is very pleasant to the eye, with the diagonal lines at the back of the case doubling as cooling slots A row of ten function keys above the main keyboard are also angled to enhance the lines of the computer, but this does not make them awkward to use

The main keyboard is split into three sections the qwerty layout and standard control keys, a group of eight editing keys, and on the far right a numerical keypad complete with arithmetic functions and an enter key The switch mechanisms give a good, positive feel to the keys without being in the luxury class They appear to be of the same type of construction as those in the other new Atari model, the 130 XE – a dimpled membrane pad but with individual return springs On the pre-production model the space bar had become intermittent, perhaps because it has had a very gruelling life to date, indicating that the keyboard is not very heavy-duty, or, just as likely someone may have done some damage while taking it apart.

The ST a Mac style user interface

Along the back edge of the ST is a whole host of ports The one that is missing is a cassette interface – alien to the philosophy of the ST, and rather akin to giving the Flying Squad a bicycle Without a disc drive an Atari ST is as good as useless, although a tape port would not improve matters much

The reset switch and on/off switch are next to the power input socket, which expects a 5 volt supply along with a sniff of 12 volts to operate the RS232 circuitry Midi Through and Midi In allows you to connect the ST up to electronic musical instruments, although the same ports can also be pressed into service for networking The pre-production model was fitted with a modulated video output and channel switch, but this feature will be omitted from the first batch of machines to arrive – only the later models will have the facility to feed a domestic television

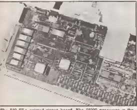
A monitor socket carries both composite and RGB signals, as well as sound

Next in line comes both Centronics parallel and RS232 serial ports, and while the Centronics port is marked 'printer' it is bi-directional and could be used for many other purposes Likewise, the RS232 port marked 'modem' can be used to communicate with much more Between these two ports and the Midi interface, the ST is handsomely equipped for dealing with standard peripherals

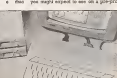
The floppy disc port takes the form of a circular parallel connector that gives 8-bit communication with one or two disc drives The plug arrangement, although professional looking actually fell out on two occasions – again, the hard treatment at the hands of the Europeans may be to blame The final port at the back of the computer is a connector intended for Atari's planned 10 Megabyte hard disc unit

One slot is situated at the left-hand side of the ST The Rom port that allows you to plug in cartridges containing up to 128K's worth of Rom. It is not clear what sort of programs are intended for this port, but it is nice to see full use being made of the 68000's large memory map On the right-hand side are two joystick ports Joystick 0 is used to plug in the mouse, a neat, two button affair which comes as part of the standard package.

Inside the whole space along the bottom of the case is taken up with a single printed-circuit board. This looks well produced with none of the patching that you might expect to see on a pre-pro-



The 520 ST's printed-circuit board. The 68000 processor is the largest chip (centre left), the Eprom chips containing TOS Gem and eventually Basic are the six chips in a row (far left) the two square chips (bottom centre) are the Atari custom chips and the 512K Ram is the row of chips (bottom centre to right)





duction model. It is very neat and I suspect that the components might have been squeezed on to a smaller board. The size of the ST is really dictated by the decision to provide 95 keys.

Not surprisingly, the circuit board is dominated by the huge 68000 CPU encased in its 64-pin DIL package. This is the original processor from the Motorola 68000 range, not the cut-down version used in the Sinclair QL. It boasts eight address and eight data registers, all 32 bits wide, a 16-bit data bus and a 24-bit address bus. So without any form of bank switching at all, 16 Mbytes of memory can be addressed. Running at a clock speed of 8MHz this CPU is a very fast and powerful device, especially by 8-bit standards.

Giving hardware support to the CPU is a 68901 chip which sorts out things such as interrupts, a custom chip from Atari called Glue to handle the jobs that would otherwise require a massive amount of TTL, and two 6850 parallel interface chips. A memory controller, again a custom Atari device, looks after the Ram and Rom. Sixteen 256 K-bit Ram chips to provide the 512K of memory on the 520 ST. On the left of the board are the six Roms that can hold up to 192K of permanent information. Other chips in evidence include a Dynamic Memory Access (DMA) device for use with the hard disc and a Western Digital 1770 floppy-disc controller, so the disc drives themselves need no special interfacing arrangements.

An integrated circuit which will be much more familiar to home computer specialists is the AY-3812, a sound chip that has been included in many computers, most recently the Amstrad. This has one noise and three tone channels, and will produce sounds up to arcade, but not quite synthesizer, standards. An extra feature that is put to good use are the two data ports; these drive the Centronics interface and allow its use in both directions.

A whole section of the circuit board (top right) is given over to video display generation, but most of the work is done by another non-standard Atari device. It handles all the graphics, taking the information from a 32K area of Ram and converting it to RGB and composite video of either the NTSC (US standard) or PAL (UK system) variety, depending on how the CPU programs it.

The display does not have any sprite-like hardware (or player-missile graphics, as Atari calls them), so moving shapes smoothly around the screen depends upon the CPU's ability to manipulate the large bit mapped screen quickly. This it appears to do with consummate ease: a combination of a fast clock speed and good firmware routines seems to do the trick.

There are three levels of video resolution available on the Atari ST.

Low-resolution is 320 × 200 pixels in 16 colours, which can be chosen from a pallette of 256 (if you are using a composite monitor). This is the sort of video display that earlier computers would have been proud to call high-resolution!

Moving up to medium-resolution, the ST gives 640 × 200 pixels in four colours, which again you can choose from the pallette.

Finally, hi-resolution only allows two colours but at a resolution of 640 × 400, which compares well with the Macintosh at 512 × 342. To resolve this amount of detail you will need a high-definition monochrome monitor. An interesting feature of the ST is its ability to check the monitor socket to see what is plugged in – if the correct connections have not been made by the monitor cable then you will not be allowed to enter an inappropriate video mode.

The standard of graphics produced by demonstration software was well up to the standards that we have come to expect from Atari. In low-resolution mode the pictures on display – some of which are printed in this article and on the front page – although obviously the product of much patient programming, were outstanding. In the medium-resolution mode the detail was more than sufficient for the Gem operating system to work well, but there was no monochrome monitor available, and I could not fool the ST into giving me a hi-res display – though if it's better than the Mac then it must be good.

The keyboard is by no means a passive device. Located beneath the keys is a one-chip microcomputer, the 6301, which scans the keyboard and joystick ports. The data it collects is returned to the main CPU, which is thereby relieved of a tedious task that would otherwise slow it down. Decoding the signals from the mouse is also a job for the slave CPU, and this information is returned as coded data to the 68000.

There are three floppy disc drives available for the ST, the SF324 (250K), SF354 (500K) and SF314 (1M), although the 250K drive may not be marketed. All are 3½ inch Sony format drives with external power supplies. Two monitors will be offered, a very high resolution monochrome unit and a colour monitor.

A range of printers in matching livery will also be available, including a cheap daisywheel.

As a piece of hardware the 520 ST deserves much praise. It uses the most modern technology that is affordable in a package that gives a professional impression. As a working environment software writers will find little to complain about. The only facility that is missing is some form of expansion bus – add-on manufacturers will find it hard to interface devices directly with the CPU.

Atari are rightly proud that such a state-of-the-art configuration was designed, built and working inside six months.

TOS and Gem

The jewel in the crown of the ST, though is not the hardware. Instead it is a product bought in from outside: the *Gem Desk-top* operating system.







Any computer is only as good as its software, and the 520 ST will be supplied as standard with an impressive suite of programs

The 192K Rom will contain the TOS disc operating system, *Gem Desktop*, *Gem Write*, *Gem Paint*, Personal Basic and DR Logo – all except the first supplied by Digital

Atari's TOS disc-operating system (Tramiel Operating System) is a cross between CP/M-68K, a 68000 version of CP/M, and MS-DOS. It offers many of the same facilities as most microcomputer disc-operating systems, but the fact that it may be no easier to use that any of the others is irrelevant.

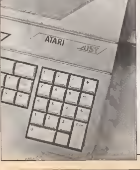
The sort of thing that a lay person might need to use a DOS for – formatting and copying discs and clearing out the redundant files in order to make space – can all be achieved by using *Gem* – the second level of operating system – and you can have fun at the same time

The ST normally powers up into the *Gem* system In its simplest form, you are presented with an icon graphics display representing disc drives and a trash can and a few menu headings such as *File*, *View* and *Options* Move the on-screen – by moving the mouse – over a disc icon with the mouse, double-click the mouse button, and the contents of the disc are displayed in a window If the window is not to your liking, you can drag it about, expand or shrink it or even make it fill the screen, all with the aid of the mouse If you now pick up a file and drag it to the trash can, Gem will ask you if you really want to erase the file, confirm this by clicking the mouse over the OK option, and the task is performed

Using Gem (which stands for Graphics Environment Manager) is a pleasure Whether it is any more efficient than getting to grips with the average DOS is not the point Because it is obvious what is happening anyone can have the confidence to use it

The ST will use Digital's Personal Basic. The final version of Personal Basic is still quite a long way off by the looks of the ST previewed here Atari UK do not even have a command word list for it yet Writing Basic programs is enhanced by the provision under Gem of three windows, one for the listing, one for screen output and one command line, much in the same manner as the arrangement on the QL in monitor mode Because of the unfinished state of the Basic it still very much remains to be seen just how many of the Gem graphics features will be available to the Basic programmer

DR Logo will also be included in the price of the ST and here again it isn't clear to what extent Logo will be integrated with the *Gem* environment.



There were no signs of even preliminary versions of either the wordprocessing or drawing programs *Gem Write* and *Gem Paint* at Atari UK.

The big question now is – what will be available, when and at what price?

First of all, the 130ST with the $399 price tag now seems lost, perhaps for ever.

Secondly, the first batch of machines that Atari plan to produce reflects the current unfinished state of the software. Instead of being burnt into the on-board Roms, the system software will be supplied on disc, with little more in Rom than a boot-strap loader. These machines will begin to arrive in small quantities at the end of June, though don't expect to get one unless you are one of the many software houses that have fallen under the ST's spell

Prices and availability

Now, most importantly, prices Atari has decided that bundling items together is the best way to keep costs down

Three versions will be offered – the first in quantity from September, the second beginning around a month later and the third probably from 1986

The first comprises a high-resolution monochrome monitor, 500K disc drive and 520 ST and will retail at £899.88 – an astounding £2000 less than the equivalent Macintosh, but still a great deal more than most people can afford

The second will include a 512K ST, 500K disc unit, but no monitor Instead it will be fitted with a modulator for use with a domestic TV This version will cost £699

The third version, as yet unpriced, will be as the first version but replace the monochrome monitor with a colour one. It is expected to cost around £900

Conclusion

The ST is undoubtedly a most exciting product But while Atari has got its act together in terms of hardware, it is it would seem, at the mercy of Digital Research for delivery of the software If this fulfills its promise than the ST could clean-up in the US as a Mac-beater

Sadly, though, it may still be too expensive to bridge the gap between the home and business in Britain At £700 for the lowest-price configuration, it is still too expensive to achieve very large volume sales in this country

The 520 ST is not the £500 disc-based 128K machine promised back in January That Atari has decided, apparently for reasons of global economy, to drop its 130ST model is a great disappointment


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Automatic

Program *Zapp* **Price** £5.95 **Micro** Amstrad CPC 464 **Publishers** Newson Consultants, Milton Trading Estate, Milton, Abingdon, Oxford.

Machine code development tools released for the Amstrad must expect to be compared with the official offering, *Devpac*. The first thing you notice about *Zapp*, a combined assembler, editor and monitor, is that it is considerably easier to use than the Amsoft program.

Assembler mnemonics are entered at the bottom of the screen, the syntax is checked, and if you have given a valid instruction (or assembler pseudo-mnemonic), it is inserted in the listing displayed above. The position it takes, the *Current Line*, is marked by a cursor which can be moved around to allow the insertion or deletion of lines at any point. One time-saving feature of *Zapp* is that you never need to bother with line numbers, these are provided automatically, renumbering the routine as new lines are entered.

The assembler uses a one-pass technique which speeds up assembly, but puts some restrictions on the user. Forward references must avoid offsets, so the instruction *JRLABEL+8* is illegal if the address *Label* is further down the listing.

The monitor and disassembler are designed to work with your own program – they even display any labels that are known – but are clumsy when looking at other sections of memory. The monitor will single-step routines and insert breakpoints, but its "front panel" display (the report of the state of the CPU) could be better labelled and contain more information.

After using *Zapp* for some time, I began to find some of its shortcomings tiresome – no DEFS or ENT pseudo-mnemonics and the slowness with which the screen cursor moves around. Most of all, the program runs in the 40-column mode, so if you add comments to your listing you find the display becomes ragged.

I suspect that Amstrad *Zapp* is a fairly straight forward conversion from the Spectrum program. Hewson have patched the user RST for printing (as the Spectrum's RST 10), which is fair enough, but the manual gives the impression that the user RST will always print a character, when it normally causes a reset!

While I can recommend *Zapp* to newcomers and dabblers in machine code, if you are intending to write a magnum opus then the extra money and patience needed to get to grips with *Devpac* will be worthwhile.

Jeff Naylor

Near genius

Program *Leonardo* **Price** £7.95 **Micro** Spectrum 48K **Supplier** Creative Sparks, Thorn EMI Computer Software.

Calling a graphics package *Leonardo* could be seen as almost foolhardy self-confidence, creating a comparison with the Renaissance's greatest thinker.

In fairness, *Leonardo* is one of the better offerings in this highly competitive market. Freehand drawing by cursor keys or more conveniently joystick, is catered for with line, rubber-banding, variable brush width, etc. The cursor can draw continuous or broken lines and there are also very good circle, arc and ellipse commands.

The windowing commands allow for picture element manipulation, such as magnification and mirror imaging (although a bug caused my copy to lock up). Details can be held in memory and repeated as a brush pattern. Windows or the full screen can be scrolled as well, which is useful for avoiding attribute problems.

UDG creation is not the best system I've seen, but incorporating them in a picture is relatively simple. Finally, a sophisticated programmed drawing system allows for handling of repetitive elements, and finished works can be saved to tape or printer. The manual is almost 100 pages thick, its first half introducing these features via practical examples, the second summarising the stroke commands.

My main criticism of *Leonardo* is that it is far from immediately friendly. However, perseverance should bring a Mona Lisa-ish smile to the user's face, if not a full-blown grin.

John Minson

In language

Program *QC – C compiler/assembler/linker* **Micro** QL **Price** £59.95 **Supplier** GST Computing Systems Cambridge, 91 High Street, Longstanton, Cambridge

There cannot be many programmers who have not heard of *C* – the 'in' language of the 1980s. While originally intended as a systems programming language, it is in fact one of the best general purpose languages around and is ideal for many areas of application programming. Now at last we have a *C* compiler for the QL written by the highly respected systems house which produced the original QL operating system.

In addition to the *C* compiler itself you get a machine code assembler and a general purpose linker. There is a comprehensive 74-page manual which comes in a handy A-5 ring binder and a copy of *A book on C* by R E Berry and B A E Meekings. The compiler will run on any QL, and does not need additional Ram or discs and runs on the normal QDOS operating system not the "alternative" GST 68K/OS system.

The language implemented by *QC* is not the full *C* but an enhanced version of *Short C*. The principal features missing are floating point and structure. It is still an excellent language, entirely suitable for most types of program development, except for applications heavily dependent of floating point. In addition a comprehensive library is supplied including both sequential and random I/O and numerous String and Character Handling Routines.

A nice feature of the *QC* compiler is an option which lists the assembly language produced with the original *C* statements as comments, so that you can see exactly what code has been produced for each *C* statement.

The assembler *QCASM* is a general purpose assembler with the usual facilities and can be used to assemble machine code quite independently of *C* if you wish.

The linker is used to combine your program with any library modules needed or other modules.

So what are the advantages of using *C* on the QL over SuperBasic? Firstly, there is an enormous increase in speed – *C* programs run about 100 times faster than the SuperBasic. Secondly, you now have the means to write programs which are able to use the full power and flexibility of the machine, including multi-tasking. Lastly, you have the ability to combine easily with machine language and with modules written in any other language using the linker.

And the disadvantages? Compared with SuperBasic it is much more laborious to develop a program and the program is much more difficult to debug. There are also memory problems, but these are much reduced if you have discs or extra Ram. With microdrives only storage, it is a bit tight, with about 160 sectors free for use (and the editor has to be fitted in). This limits the size of a *C* program that can be handled to a few hundred lines.

Nevertheless *C* is a big software advance for the QL and, for anyone interested in serious programming, a bargain at £59.95.

Norman Macleod

Freestyle Challenge

Take the plunge with this decathion type game for swimmers – on Spectrum by *Martin Mann*

In this game you take on the roll of an Olympic swimmer, going for the World Record (shown on the bottom of the screen) You must press the space bar at a constant speed for a good stroke – it is best to start off slowly then speed up, beginning when the starter fires his gun.

Your speed is shown by a line placed under the watching crowd, and your time in the top left hand corner

After the title screen appears, press Space to begin – and take the plunge!

Graphics

Line 50	A, B and C
Line 140	D
Line 256	E and F
Line 258	G and H
Line 260	I and J
Line 262	E and K
Line 461	N and M
Line 462	P and Q
Line 464	L and O

```
1 BORDER 1: PAPER 1: INK 4: CLS : GO SUB 9000
2 LET ink=0
3 LET hi=20.12
4 LET a$="MANNY"
5 CIRCLE 125,100,20:: CIRCLE 80,100,20: CIRCLE 170
,100,20: CIRCLE 100,60,20: CIRCLE 147,60,20
6 LET page=0
7 PRINT  INK 7; FLASH 1;AT 21,12;"WELCOME"
10 PRINT  INK 7;AT 1,9;"OLYMPIC DRIMMER"
20 PRINT  FLASH 1; INK 2;AT 0,7;"[redacted]"
30 PRINT  FLASH 1; INK 2;AT 2,7;"[redacted]"
40 PRINT  FLASH 1; INK 2;AT 1,7;"B"
51 PRINT  FLASH 1; INK 2;AT 1,23;"B"
52 IF page=1 THEN  GO TO 59
53 BORDER 2: BORDER 7: BORDER 1
54 IF INKEY$="" THEN  GO TO 56
55 GO TO 53
56 BORDER 1: CLS
57 LET page=1: GO TO 10
59 PRINT AT 12,2;"A";AT 13,2;"B";AT 12,3;"C"
60 PLOT 0,0: DRAW 50,95: DRAW 205,0: PLOT 255,0: DR
AW  255,0
70 PLOT 10,0: DRAW 82,85: DRAW 0,10: DRAW 0,-10: DR
AW 202,0
80 PLOT 0,152: DRAW 58,0: PLOT 195,103: DRAW 60,0:
PLOT 0,118: DRAW 255,0
81 FOR y=0 TO 31 STEP 2
89 PRINT  INK 3;AT 3,y+1;"a"
90 PRINT  INK 0;AT 3,y;"a"
100 NEXT y
101 FOR y=0 TO 31 STEP 2
102 LET l=INT (RND*4)
103 PRINT  INK 0;AT 4,y+1;"a"
104 PRINT  INK 3;AT 4,y;"a"
105 NEXT y
106 FOR y=0 TO 31 STEP 2
107 LET l=INT (RND*4)
108 PRINT  INK 3;AT 5,y+1;"a"
109 PRINT  INK 0;AT 5,y;"a"
110 NEXT y
111 FOR y=0 TO 31 STEP 2
112 LET l=INT (RND*4)
113 PRINT  INK 0;AT 6,y+1;"a"
114 PRINT  INK 3;AT 6,y;"a"
115 NEXT y
116 FOR y=0 TO 31 STEP 2
117 LET l=INT (RND*4)
118 PRINT  INK 3;AT 7,y+1;"a"
119 PRINT  INK 0;AT 7,y;"a"
120 NEXT y
122 PRINT AT 9,24;"SPEED"
123 FOR p=0 TO 5
124 FOR t=23 TO 5 STEP -1
125 PRINT AT 9,t;"<"
126 NEXT t
127 FOR t=23 TO 5 STEP -1
128 PRINT AT 9,t;" "
129 NEXT t
130 NEXT p
131 PRINT AT 9,24;"      "
132 FOR b=0 TO 200
133 NEXT b
140 PRINT  INK 7;AT 11,3;"B"
150 BEEP .1,10
160 PAUSE 10
170 PRINT AT 11,3;" "
200 LET l=0
208 LET r=0
210 LET m=5
211 LET x=30
212 LET p=10
215 POKE 23674,0: POKE 23673,0: POKE 23672,0
220 PLOT 0,103: DRAW x,0
225 LET time=(65536*PEEK 23674+256*PEEK 23673+PEEK 2
3672)/50
230 PLOT 0,101: DRAW x,0
242 PRINT AT 0,0;"YOUR ": PRINT AT 1,0;"TIME:": PRIN
T AT 2,0;time
243 PRINT #1;AT 0,0;"RECORD TIME:";hi;" BY ";a$
256 PRINT AT 15,x;" EF "
257 PAUSE p
258 PRINT AT 15,x;" GH "
259 PAUSE p
260 PRINT AT 15,x;" IJ "
261 PAUSE p
262 PRINT AT 15,x;" KX "
263 PAUSE p
264 LET l=l+1
265 IF l=m THEN  GO SUB 290
268 IF INKEY$=" " THEN  GO SUB 270
269 GO TO 220
270 IF INKEY$<>"" THEN  GO TO 270
275 BEEP .005,(r/3)
280 LET r=r+5
281 LET m=m-1
283 IF x<3 THEN  GO TO 800
285 IF r=200 THEN  GO TO 9000
286 LET p=p-3
287 IF p<1 THEN  LET p=1
290 RETURN
295 LET x=x-5
296 LET p=p+1
300 BEEP .002,(r/3)
305 LET m=m+10
310 IF x<0 THEN  LET x=0
315 PRINT AT 9,0;"                              "
320 RETURN
400 PLOT 94,49: DRAW 120,0: DRAW 0,-10: DRAW -120,0:
DRAW 0,10
410 PRINT AT 16,12;"YOUR TIME";time
411 FOR v=0 TO 200
412 NEXT v
420 IF time<hi THEN  GO TO 450
430 GO TO 700
450 CLS : PLOT 48,95: DRAW 132,0: DRAW 0,9: DRAW -13
2,0: DRAW 0,-9
460 PRINT AT 9,6;"NEW WORLD RECORD"
461 FOR b=0 TO 10: PRINT AT 18,13;"MN"
462 PRINT AT 19,13;"PQ"
463 PAUSE 10
464 PRINT AT 18,13;"LB"
470 PLOT 81,0: DRAW 0,10: DRAW 20,0: DRAW 0,-10: DRA
W 0,15: DRAW 20,0: DRAW 0,-15: DRAW 0,5: DRAW 20,0: D
RAW 0,-5
480 DRAW -60,0
481 PAUSE 10
490 NEXT b
800 BEEP .5,5: PAUSE 2: BEEP .5,5: PAUSE 5: BEEP .5,
7: PAUSE 5: BEEP .5,4: PAUSE 5: BEEP .3,5: BEEP .5,7:
 PAUSE 10: BEEP .5,9: PAUSE 2: BEEP .5,9: PAUSE 5: BE
EP .5,10: PAUSE 3: BEEP .5,9: PAUSE 5: BEEP .3,7: BEE
P .3,5
801 PAUSE 7: BEEP .5,7: PAUSE 5: BEEP .8,9: PAUSE 5:
BEEP .5,4: PAUSE 2: BEEP .6,8
802 FOR q=0 TO 100
803 NEXT q
804 CLS
805 LET hi=time
806 INPUT AT 20,0;"INPUT NAME SUPER STAR ";a$
808 CLS
810 GO TO 10
700 CLS : PRINT AT 8,0;"HARD LUCK AMATEUR": PRINT AT
10,5;"YOU NEVER BEAT ";a$: PRINT AT 12,10;"PRESS A KE
Y": PAUSE 0: CLS : GO TO 10
9000 FOR n=0 TO 7: READ a: POKE USR "a"+n,a: NEXT n
9001 FOR n=0 TO 7: READ a: POKE USR "b"+n,a: NEXT n
9002 FOR n=0 TO 7: READ a: POKE USR "c"+n,a: NEXT n
9003 FOR q=0 TO 7: READ a: POKE USR "d"+q,a: NEXT q
9100 DATA BIN 00111100,BIN 00111100,BIN 01111110,BIN
00111100,BIN 00111100,BIN 00111100,BIN 00011001,BIN 1
1111111
9110 DATA BIN 11111110,BIN 10111100,BIN 10111100,BIN
10111100,BIN 10111100,BIN 00111100,BIN 00111100,BIN 0
1111110
9120 DATA BIN 00000000,BIN 00100000,BIN 00100000,BIN
00100000,BIN 00110000,BIN 01100000,BIN 11000000,BIN 1
0000000
9130 DATA BIN 01010010,BIN 00100010,BIN 10100101,BIN
01010010,BIN 01001010,BIN 00110100,BIN 00100100,BIN 0
0011000
9140 FOR v=0 TO 7: READ a: POKE USR "e"+v,a: NEXT v
9150 DATA BIN 00000000,BIN 00000000,BIN 00111000,BIN
01111100,BIN 01111100,BIN 01111100,BIN 00111111,BIN 0
0000011
9160 FOR v=0 TO 7: READ a: POKE USR "f"+v,a: NEXT v
9170 DATA BIN 01110000,BIN 00011000,BIN 00001100,BIN
00000110,BIN 00001100,BIN 00011000,BIN 11111000,BIN 1
1111100
9180 FOR v=0 TO 7: READ a: POKE USR "g"+v,a: NEXT v
9190 DATA BIN 00000001,BIN 0,BIN 00111000,BIN 0111110
0,BIN 01111100,BIN 01111100,BIN 00111111,BIN 00000011
9200 FOR v=0 TO 7: READ a: POKE USR "h"+v,a: NEXT v
9210 DATA BIN 10000000,BIN 11000000,BIN 01100000,BIN
00110000,BIN 01110000,BIN 01100000,BIN 11100000,BIN 1
1110000
9220 FOR v=0 TO 7: READ a: POKE USR "i"+v,a: NEXT v
9230 DATA BIN 00001111,BIN 00000011,BIN 00111001,BIN
01111100,BIN 01111100,BIN 01111100,BIN 00111111,BIN 0
0000011
9240 FOR v=0 TO 7: READ a: POKE USR "j"+v,a: NEXT v
9250 DATA BIN 0,BIN 10000000,BIN 11000000,BIN 1100000
0,BIN 11000000,BIN 01100000,BIN 11100000,BIN 1111000
0
9251 FOR v=0 TO 7: READ a: POKE USR "k"+v,a: NEXT v
9252 DATA BIN 0,BIN 0,BIN 0,BIN 0,BIN 0,BIN 0,BIN 111
11000,BIN 11111110
9253 FOR v=0 TO 7: READ a: POKE USR "l"+v,a: NEXT v
9254 DATA BIN 00000011,BIN 00000011,BIN 10000011,BIN
01000011,BIN 00100001,BIN 00011111,BIN 00000001,BIN 0
0000001
9255 FOR v=0 TO 7: READ a: POKE USR "m"+v,a: NEXT v
9256 DATA BIN 11000000,BIN 11001000,BIN 11001000,BIN
11001000,BIN 10001000,BIN 11111000,BIN 10000000,BIN 1
0000000
9257 FOR v=0 TO 7: READ a: POKE USR "n"+v,a: NEXT v
9258 DATA BIN 00000011,BIN 00010011,BIN 00010011,BIN
00010011,BIN 00010001,BIN 00011111,BIN 00000001,BIN 0
0000001
9259 FOR v=0 TO 7: READ a: POKE USR "o"+v,a: NEXT v
9260 DATA BIN 11000000,BIN 11000000,BIN 11000001,BIN
11000010,BIN 10000100,BIN 11111000,BIN 10000000,BIN 1
0000000
9261 FOR v=0 TO 7: READ a: POKE USR "p"+v,a: NEXT v
9262 DATA BIN 00000001,BIN 00000011,BIN 00000111,BIN
00001100,BIN 00001000,BIN 00001000,BIN 00011000,BIN
0
9263 FOR v=0 TO 7: READ a: POKE USR "q"+v,a: NEXT v
9264 DATA BIN 10000000,BIN 11000000,BIN 11100000,BIN
00110000,BIN 00010000,BIN 00010000,BIN 00011000,BIN 0
9265 RETURN
```

Room with a view

You won't be addressed properly without this hex dump routine for the QL by ***Malcolm Scorer***

For anyone interested in machine code programming a hex dump routine is a useful utility It allows the user to view large chunks of data at once and is ideal for checking that machine code routines have been entered correctly, or perhaps examining the contents of the QL Roms

This program is an attempt to produce such a routine Not only does it show the actual hex data, but also displays the equivalent Ascii codes

After loading and typing '*run*' the title screen is displayed and you are presented with the following three options 1) Direct output to printer and screen (F1), 2) Quit (F2), 3) Output to screen (F3)

When options one or three are selected you will be asked to enter the start and end addresses of the area of memory to be examined You may enter these either in decimal or if preceded by a '$' in hex. The data will than be displayed in the following format:

Address (5 bytes) followed by 16 bytes of data and then the equivalent Ascii codes All control and non printable characters are replaced by a dot ('' '') This format allows nearly 300 bytes to be displayed on the screen at one time

The output can be stopped and started by pressing *Ctrl* and *F5* keys together and may be aborted by holding down the *Esc* key

Program Notes

Line No	
100-180	Sets up the initial display
160-360	Gives option to direct output to printer and then prompts for start and end addresses Calls dump procedure
380-460	General purpose decimal to hex conversion routine which allows the number of hex digits to be specified.
480	Start of actual 'dump' routine
520	Converts address to 5 digit hex.
530-570	Loops around building up two strings One consists of 16 bytes of hex data and the other contains the Ascii codes
580	Outputs to printer if option (F1) selected.
590	Outputs to screen
600	Checks for *Esc* key Exits if pressed
640-660	Converts a number <256 to two hex digits This has been used instead of the more general purpose routine (hex) to speed up the program.
680-820	Converts a number from either base 10 or base 16, depending on whether the number is preceded by a '$' or not.

```
100 MODE 4:CSIZE 0,0:PAPER 0:PAPER #0,2:BORDER #0,5:INK 4:CLS
110 a$="0123456789ABCDEF"
120 msb=1.048575E6
130 OPEN #3,ser1:BAUD 1200
140 CSIZE 3,1:AT 5,7:PRINT "H E X  D U M P":CSIZE 0,0
150 PRINT:PRINT TO 30 , 1984  M.Scorer"
160  REPeat loop
170   CLS #0
180   PRINT #0,"'F1' for printout"
190   PRINT #0,"'F2' to quit"
200   PRINT #0,"'F2' to continue"
210   REPeat kloop
220     k=KEYROW(0):IF k<>0 THEN EXIT kloop
230   END REPeat kloop
240   IF k=8 THEN EXIT loop
250   IF k=2 THEN printer=1:ELSE printer=0
260   CLS #0
270   INPUT #0,"Start Address " ' sadd$:sadd=addr(sadd$)
280   INPUT #0,"End Address " ' eadd$:eadd=addr(eadd$)
290   IF eadd>msb THEN eadd=msb
300   IF sadd>= eadd THEN sadd=(eadd-235)
310   CLS
320   dump sadd,eadd
330  END REPeat loop
340  CLOSE #3
350  CLS:CLS #0
360 STOP
370 :
380 DEFine PROCedure hex(dec,lgt)
390   LOCal loop
400   h$="":a=0
410     REPeat loop
420      IF NOT dec THEN EXIT loop
430      a=INT(dec/16): dig=1+dec-a*16:h$=a$(dig)&h$:dec=a
440     END REPeat loop
450  h$=FILL$("0",lgt-LEN(h$))&h$
460 END DEFine
470 :
480 DEFine PROCedure dump(sadd,eadd)
490  LOCal loop,loop2,char$,byte
500  FOR loop = sadd TO eadd STEP 16
510    char$="":hx$="":dec=loop
520    hex dec,5
530    FOR loop2 = loop TO loop+15
540      byte=PEEK(loop2)
550      IF byte > 31 AND byte < 122 THEN char$=char$ &CHR$(byte)
:ELSE char$=char$ & "."
560      hx$ = hx$ & conv$(byte) & " "
570    END FOR loop2
580    IF printer THEN PRINT #3,h$ ! hx$;char$
590    PRINT h$ ! hx$;char$
600    IF KEYROW(1)=8 THEN EXIT loop
610  END FOR loop
620 END DEFine
630 :
640 DEFine FuNction conv$(byte)
650  RETurn a$(INT((byte && 250)/16)+1) & a$(INT(byte && 15)+1)
660 END DEFine
670 :
680 DEFine FuNction addr(z$)
690   LOCal base,x,y,z
700   IF z$(1)="$" THEN base=16:z$=z$(2 TO):ELSE base=10
710   x=0:FOR y=1 TO LEN(z$)
720   z=CODE(z$(y))
730   SELect ON z
740     =48 TO 57 :z=z-48
750     =65 TO 70 :z=z-55
760     =97 TO 102:z=z-87
770     =REMAINDER :RETurn 0
780   END SELect
790   x= x * base + z
800  END FOR y
810  RETurn x
820 END DEFine
```

Number conversion

*Convert numbers into words with this routine for the CBM 64 by **N A Syed***

This is a program that will convert numbers into words. You can enter any number (in numerals) from −999999999 to 999999999 with or without decimals. The number is then displayed in words.

As an application, the program could be useful as a tool for teaching children reading and writing numbers, or be used as a sub-routine in a program if numbers were required to be displayed as words.

Program Notes

Line No	
35-90	Main routine of program
300-410	Input number and separate decimal digits
500-600	Separates number into groups of three starting from the right hand side
700-1100	Converts numbers of each group into words

```
10 REM***NUMBER CONVERTER***
20 REM***N.A.SYED***
30 DIM A$(19)
35 REM***MAIN ROUTINE***
40 GOSUB 100 :REM READ DATA
50 GOSUB 300 :REM INPUT A NUMBER
60 GOSUB 500 :REM SEPERATE IN GROUP
70 GOSUB 700 :REM CNANGE NUMBER IN WORD
72 IF FL$="Y" THEN OOSUB 1000
75 PRINT:PRINT:PRINT:PRINT:PRINT
80 INPUT " DO YOU WANT TO ENTER NUMBER
   AGAIN",NW$
05 IF NW$ <> "N" AND NW$ <> "Y" THEN 80
07 IF NW$ ="Y" THEN 50
90 END
100 REM***READ DATA***
110 FOR I= 1 TO 19
120 READ A$(I)
130 NEXT I
140 FOR I=2 TO 9
150 READ B$(I)
160 NEXT I
170 C$(2)="THOUSAND":C$(3)="MILLION"
200 DATA "ONE","TWO","THREE","FOUR"
210 DATA "FIVE","SIX","SEVEN","EIGHT"
220 DATA "NINE","TEN","ELEVEN","TWELVE"
230 DATA "THIRTEEN","FOURTEEN","FIFTEEN"
240 DATA "SIXTEEN","SEVENTEEN"
250 DATA "EIGNTEEN","NINETEEN"
260 DATA "TWENTY","THIRTY","FORTY"
270 DATA "FIFTY","SIXTY","SEVENTY"
280 DATA "EIGHTY","NINETY"
295 RETURN
300 REM*** INPUT A NUMBER ***
310 PRINT "♫"
315 PRINT:PRINT
320 INPUT"GIVE A NUMBER PLEASE",KL$
321 NO=VAL(KL$)
322 IF NO>999999999 THEN 310
324 HL=0
325 IF NO < 0 THEN HL=NO
330 IF NO < 0 THEN NO=NO*-1
340 IF NO= 0 THEN PRINT "ZERO"
350 IN= INT(NO):NN$=STR$(IN)
360 N$=KL$:L=LEN(N$)
352 DK=0:ZP=0
355 HJ$="N"
370 FOR I= 1 TO L
380 IF MID$(N$,I,1)="." THEN HJ$="Y"
390 IF HJ$="N" THEN DK=DK+1
392 IF HJ$="Y" THEN ZP=ZP+1
395 NEXT I
397 DK = DK+2
400 DF$=MID$(N$,DK,ZP)
405 PRINT:PRINT
406 FL$="N"
407 IF NO <> IN THEN FL$="Y"
410 RETURN
500 REM*** SEPARATE IN GROUP ***
510 M=1:X$(M)="":L=LEN(NN$)
515 CO=0
520 FOR I= L TO 2 STEP -1
530 CO=CO+1
540 TE$=MID$(NN$,I,1)
550 X$(M)=TE$+X$(M)
560 IF CO=3 THEN 580
570 OOTO 590
580 CO=0:M=M+1:X$(M)=""
590 NEXT I
600 RETURN
700 REM*** CHANGE GROUPS IN WORD ****
710 IF HL < 0 THEN PRINT "MINUS ",
720 H=0:T=0:E=0
730 FOR I = M TO 1 STEP -1
740 Z$=X$(I):L=LEN(Z$)
750 E=L+1
755 JK$="N"
760 FOR J=1TO L
770 TE$=MID$(Z$,J,1)
780 T=VAL(TE$)
785 E= E-1
790 IF T= 0 THEN 860
810 IF E=3 THEN 830
820 OOTO 840
830 H=T:D$=A$(T)+" HUNDRED"
840 IF E= 2 THEN GOSUB 900
845 IF E= 1 THEN D$=A$(T)
850 PRINT D$,SPC(2)
860 NEXT
870 IF VAL(Z$)= 0 THEN 890
880 PRINT C$(I)
890 NEXT
895 RETURN
900 W=0:R=0
910 W=VAL(Z$):R=W-H*100
915 IF W <=19 THEN R=W
920 IF R > 0 AND R <= 19 THEN 940
930 OO TO 950
940 D$=A$(R):J=J+1
950 IF T > 1 THEN D$=B$(T)
960 RETURN
1000 PRINT "DECIMAL ";
1010 L=LEN(DF$)
1020 FOR I= 1 TO L
1030 X$=MID$(DF$,I,1)
1040 IF X$="0" THEN PRINT " ZERO ",
1060 K=VAL(X$)
1070 IF K<> 0 THEN 1075
1072 OOTO 1080
1075 PRINT A$(K),SPC(2);
1080 NEXT I
1090 PRINT
1100 RETURN
1120 END
```

Window framed

*Smooth scrolling windows on the BBC B and Electron – from the keyboard of **Philip Whitehurst***

This program will produce a smooth-scrolling window on a Mode 4 screen. The window is set up in Line 1020, and follows the normal Tab co-ordinates

The majority of the program is in machine code which is described line by line within the listing – for those who don't know the mnemonics off by heart!

The routine can easily be adapted for Modes 0 or 3, but not the colour modes, as in these cases a different method is used for storing screen data

A demonstration is given using the data in Lines 100 to 290 – acting much like a moving notice board

Changes for Mode 0 and 3 are given in lines 3000-3060

Program Notes

Line No	
50	Calls assembly routine initialising routine
100-290	Demo program
1020	Window parameters
1030	Calculates last byte in window
1040-1480	Assembly language
2000-2070	Data for demo program

```
  10REM* scrolling window for text *
  20REM* P.O.Whitehurst          *
  50PROC_assemble
 100MODE3
 110VDU23,1,0,0,0,0,0,0,0,0
 190REM* DEMO *
 200READA$
 210IFA$="*"THENRESTORE2010:GOTO200
 220PRINTTAB(X2%,Y%);A$;
 250FORF=1TO8
 260CALLscroll
 280NEXT
 290GOTO200
1000DEFPROC_assemble
1010REM Set up scroll screen params.
1020X1%=2:X2%=37:Y%=23
1030end%=&4007+Y%*640+X2%*8
1040DIMQ% 200
1050FOR pass=0 TO 2 STEP 2
1060P%=Q%
1070[
1080OPT pass
1090.scroll LDA#19:JSR&FFF4
1100\ Set up end of scrolling area
1110\ addresses
1120LDA#end% MOD 256:STA&70:STA&73
1130LDA#end% DIV 256:STA&71:STA&74
1140LDY#0:STY&72
1150\ set up counter.
1160.loop1 LDX#(X2%-X1%)+1
1170CLC:PHP     \ set stack-clear carry
1180.loop PLP   \ load processor status
1190LDA(&70),Y  \ screen byte
1200ROLA        \ rotate it left
1210STA(&70),Y  \ & put it back.
1220PHP         \ Save the carry bit.
1230LDA&70      \ decrement present
1240SEC         \ screen byte
1250SBC#8       \ by eight
1260STA&70      \ to obtain
1270LDA&71      \ the location
1280SBC#0       \ of the screen byte
1290STA&71      \ to the left of it.
1300DEX         \ Reduce counter
1310BNEloop     \ Go back if non-zero
1320.next PLP   \ clear stack
1330LDA&73      \ Load old values
1340SEC         \ of end of scrolling
1350SBC#1       \ area & reduce them
1360STA&73      \ by 1.
1370STA&70      \
1380LDA&74      \
1390STA&71      \
1400LDX&72      \ increase counter
1410INX         \ by one
1420STX&72      \ put it back
1430CPX#8       \ last time?
1440BNEloop1    \ If not-go back.
1450RTS         \ end routine.
1460]
1470NEXT
1480ENDPROC
2000REM demo data
2010DATAT,h,i,s, ,p,r,o,g,r,a,m
2020DATA ,w,i,l,l, ,s,c,r,o,l,l
2030DATA ,w,o,r,d,s, ,a,c,r,o,s,s
2040DATA ,t,h,i,s, ,m,i,n,i,a,t,u,r,e
2050DATA ,s,c,r,e,e,n, ,l,i,k,e
2060DATA ,t,h,i,s,.,.,.,.,.,.,.,.
2070DATA ,*
3000REM changes to program for mode0
3020REMline100MODE0
3030REMline1030end%=&3007+Y%*640+X2%*8
3040REM changes to program for mode3
3050REMline100MODE3
3060REMline1030end%=&4007+Y%*640+X2%*8
```

Balanced accounts

The final part of the home financial program for all Amstrad users by ***D G Shedden***

This week, a blow by blow account of the listing. If you don't want to type it in send me £3 at Lomand, The Green, Belchamp St Paul, Sudbury, Suffolk and I'll send you a tape.

Program notes

Lines 1 to 920–Contain various subroutines used regularly in the program such as error reports, checking if Standing Orders are due, checking if the entry just made is one in which you are interested in running totals, sorting routines and validation of dates

1000 to 1180–Handle initialisation and declare sizes of arrays, etc. If a different size of account is required then the alterations should be made here. If all the available space is not used there is no loss in saving and loading times because only occupied areas of the arrays are saved

2000 to 2150–Main menu section. You return here after all the subroutines and variables used are returned to standard conditions. You are not allowed to call options unless they can be satisfied. For example, you cannot display the account until details have been loaded or entered.

3000 to 3640–Display the statement. On the screen display debits are shown in red and credits in black. To keep to 40 columns the details are shortened but appear in full on the hard copy. This is the only routine to have separate parts to carry out the two forms of display. A complete check on all previous months is made to ensure that brought forward balances are correct in case there have been any retrospective entries

4000 to 5580–This section handles the reconciliation section. A marker is added to each entry made and changed if the entry has been cleared. It makes no difference to the data length whether or not this option is ever used. Reconciliation is effected by displaying each entry in turn and responding y/n to the prompts

6000 to 6260–Allow examination or deletion of entries. Alteration was considered but rejected because of the complexity for what it hoped will be a rarely used option. If an error has got through the check before entry it *must* be deleted and re-entered

8000 to 8400–This is the input section. Having determined the month you are invited to enter the date and details of the entry. A check is made for valid date - eg, 31st June. If any Standing Orders are due before this date then they will be posted. To exit, an entry of '99' is requested so all remaining S.O.s are entered.

Finally entries are sorted into date order before returning to the menu. Projected cashflow can be achieved merely by entering the *Input Data* mode and then leaving it

9000 to 9600–These save and load the *Data* files. As written the program will handle any number of accounts, but if only one is to be used the following procedures will save time. Add to Lines 9050 to 9530,, *File$*. Delete 9500 and 9510 and make 9520 into 9500

10000 to 11720–Handle the creation of the Standing Orders file. These can either be displayed individually showing all months each is payable or alternatively which S.O.s are due in any month. These can be added to or deleted at any time

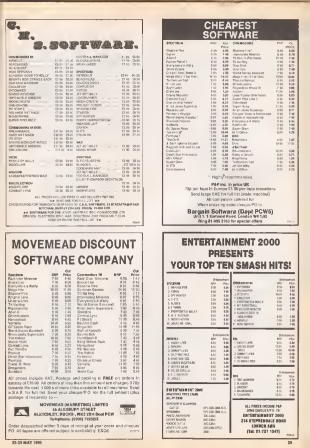
12000 to 14580–Create the special category entries. Once established, any debit or credit entry or standing order with the same name will be added to a running total. It pays to spend some time considering your interests before entering any data since changes are only possible by deleting and re-entering details

The remainder of the program consists of instructions and an autosave line.

```
6240 IF q$="B" THEN CLS#3:RETURN
6250 IF q$="" THEN NEXT
6260 RETURN
7999 REM *** INPUT DATA ***
8000 DIM tem$(pa+1,1),tem(pa+1,1)
8020 GOSUB 460
8030 q$="INPUT DATA FOR "+an$(zz):GOSUB 440
8035 PRINT#3,"Please wait a moment"
8040 ce=1
8050 FOR i=0 TO pa
8060 d=0:WHILE MID$(a$(i,1),0,1)="1" AND d=0
AND a(i,1)<>0:d=1
8070 tem(ce,1)=a(i,1):tem$(ce,0)=a$(i,0):tem(
ce,0)=a(i,0)
8080 IF tem(ce,1)>f AND zz=1 THEN tem(ce,1)=f
8090 IF tem(ce,1)>30 AND (zz=3 OR zz=5 OR zz=
8 OR zz=10) THEN tem(ce,1)=30
8100 ce=ce+1
8110 WEND
8120 NEXT
8130 IF p(z)>1 THEN 8140 ELSE 8230
8140 FOR n=1 TO p(z):FOR x=1 TO ce
8150 IF tem(x,1)=b(n,z) AND INSTR(b$(n,z),tem
$(x,0)) THEN tem(x,1)=99
8160 NEXT:NEXT
8170 IF p(z)=1 THEN 8230
8180 CLS#3:FOR n=1 TO p(z)
8190 IF b(n,z)=99 THEN GOSUB 620:GOTO 8220
8200 PEN 2: PRINT USING "##";b(n,z);:PRINT TA
B(4);LEFT$(b$(n,z),LEN(b$(n,z))-1);TAB(30);:P
EN 2+(1 AND s(n,z)<0):PRINT USING "#####.##-"
;s(n,z):REM all hashes
8210 IF n MOD 17=0 THEN GOSUB 300:GOSUB 440
8220 NEXT
8230 CLS#3:er=0: INPUT #3,"Date e.g. 3, - or
99 to QUIT";s:CLS#3
8240 IF s=99 THEN 8270
8250 GOSUB 900
8260 IF er THEN 8230
8270 FOR x=1 TO ce:GOSUB 200:NEXT
8280 IF s=99 THEN GOSUB 600:GOTO 8400
8290 INPUT #3,"Cheque No (or just ENTER) ",d
a$
8295 INPUT #3,"Details ";det$:det$=UPPER$(det
$):CLS#3
8300 INPUT #3,"Debit or Credit (D or C)";d$:d
$=UPPER$(d$):CLS#3
8305 IF d$<>"D" AND d$<>"C" THEN PRINT CHR$(7
):CLS#3:GOTO 8300
8310 INPUT #3,"Amount ";am:CLS#3
8320 IF d$="D" THEN am=-am
8330 PRINT#3,s;da$;" ";LEFT$(det$,20);" ";:PR
INT#3,USING "#####.##-";am:GOSUB 540:REM 1st
item is pound
8340 IF z$<>"Y" THEN 8230
8345 b$(p(z),z)=det$:s(p(z),z)=am:GOSUB 350
8350 b(p(z),z)=s:b$(p(z),z)=da$+" "+det$+"0"
8360 REM 2: PRINT USING "##";b(p(z),z);:PRINT
 TAB(4);LEFT$(b$(p(z),z),LEN(b$(p(z),z))-1);T
AB(30);:PEN 2+(1 AND s(p(z),z)<0):PRINT USING
 "#####.##-";s(p(z),z):REM all hashes
8380 p(z)=p(z)+1
8385 IF p(z)=60 THEN CLS#3:PRINT#3,"** MONTH
NOW FULL **":GOSUB 500:s=99:GOTO 8270
8390 GOTO 8230
8400 ERASE tem$,tem:RETURN
8999 REM *** SAVE DATA ***
9000 CLS:LOCATE 10,12:PRINT"PREPARE RECORDER
TO SAVE":LOCATE 15,13:PRINT"PRESS ANY KEY"
9010 WHILE INKEY$="":WEND
9020 REM *** IF USING WITH DISC THEN DO NOT T
YPE LINES 9000 & 9010 AND TYPE LINE 9030 AS 9
000
9030 CLS:LOCATE 5,10:PRINT"SAVING DATA - PLEA
SE WAIT":SPEED WRITE 1
9040 OPENOUT file$
9050 WRITE #9,pa,ct,year,f,start,name$
9060 FOR i=0 TO pa
9070 WRITE #9,a$(i,0);a$(i,1);a(i,0);a(i,1)
9080 NEXT
9090 FOR i=0 TO 12:WRITE #9,bfwd(i):NEXT
9100 FOR i=0 TO 11:WRITE #9,p(i):NEXT
9110 FOR i=0 TO 11:FOR x=0 TO p(i):WRITE #9,b
$(x,i);b(x,i);s(x,i):NEXT:NEXT
9120 FOR i=1 TO ct:WRITE #9,ct$(i);spend(i):N
EXT
9130 CLOSEOUT
9140 RETURN
9499 REM *** LOAD DATA ***
9500 CLS:INPUT#3,"WHAT IS THE ACCOUNT NAME ";
file$:CLS#3:file$="!"+file$
9510 LOCATE 12,12:PRINT"LOADING DATA"
9520 OPENIN file$
9530 INPUT #9,pa,ct,year,f,start,name$
9540 FOR i=0 TO pa
9550 INPUT #9,a$(i,0),a$(i,1),a(i,0),a(i,1):N
EXT
9560 FOR i=0 TO 12:INPUT #9,bfwd(i):NEXT
9570 FOR i=0 TO 11:INPUT #9,p(i):NEXT
```

```
9580 FOR i=0 TO 11:FOR x=0 TO p(i):INPUT #9,b$(x,i),b(x,i),n(x,i):NEXT:NEXT
9590 FOR i=1 TO ct:INPUT #9,ct$(i),spend(i):NEXT
9600 CLOSEIN:GOSUB 530:RETURN
9999 REM *** STANDING ORDERS ***
10000 i=0:CLS
10010 q$="STANDING ORDERS MENU":GOSUB 440
10020 PRINT"  1) NEW PAYMENTS":PRINT
10030 PRINT"  2) EXAMINE/DELETE ENTRIES":PRINT
10040 PRINT"  3) PRINT STANDING ORDERS":PRINT
10050 PRINT"  4) RETURN TO MAIN MENU":PRINT:PRINT
10060 INPUT #3, "PLEASE ENTER SELECTION (1-4) ",x:CLS#3
10070 WHILE pa=0 AND (x=2 OR x=3)
10080 GOSUB 420:RETURN
10090 x=0
10100 WEND
10110 IF x<1 OR x>4 THEN GOSUB 400:GOTO 10060
10120 IF x=4 THEN RETURN
10130 ON x GOSUB 10500,11000,11500
10140 CLS:ch=0:GOTO 10000
10499 REM *** ENTER NEW ITEMS ***
10500 CLS:CLS#3:PEN 2:q$="STANDING ORDERS":GOSUB 440
10510 IF pa>19 THEN PRINT#3,"** FILE FULL **":GOSUB 500:CLS#3:RETURN
10520 q$="New Items":GOSUB 440
10530 PRINT"(C)redit,(D)ebit or (Q)uit  :- ";
10540 INPUT #3, "Which do you require C, D or Q ";x$:x$=UPPER$(x$):IF x$<>"D" AND x$<>"C" AND x$<>"Q" THEN PRINT CHR$(7):CLS#3:GOTO 10040
10550 PRINT x$:PRINT:CLS#3
10560 IF x$="Q" THEN RETURN
10570 q$="":WHILE q$="":PRINT"Name of payment Max 18 Characters  :- ":INPUT"",q$:q$=LEFT$(UPPER$(q$),18):WEND
10580 PRINT:INPUT "Amount: £",q
10590 IF x$="D" THEN q=-q
10600 en=1:WHILE en
10610 LOCATE 1,11:PRINT:INPUT "Months Due e.g. 01040710 would be months1,4,7 &10 (Jan,Apr,Jul & Oct) or M if  Every Month :",r$:PRINT
10620 IF LEN(r$)<1 THEN PRINT CHR$(7):GOTO 10600
10630 IF  UPPER$(r$)="M" THEN r$="010203040506070809101112"
10640 en=0:FOR i=1 TO LEN(r$) STEP 2
10650 m=VAL( MID$(r$,i,2))-1
10660 IF m<0 OR m>11 THEN GOSUB 400:GOTO 10610
10670 IF en=0 THEN PRINT mo$(m);":";
10680 NEXT:PRINT:PRINT
10690 WEND
10700 er=0:INPUT#3, "Day of payment:",s:GOSUB 930:CLS#3
10710 IF er THEN 10700
10720 PRINT"Day of payment:-";s
10730 GOSUB 540:IF x$<>"Y" THEN CLS:GOTO 10500
10740 a$(pa,1)="000000000000"
10750 FOR i=1 TO LEN(r$) STEP 2
10760 M=VAL(MID$(r$,i,2))
10770 a$(pa,1)=LEFT$(a$(pa,1),m-1)+"1"+RIGHT$(a$(pa,1),12-m):NEXT
10780 a$(pa,0)=q$:a(pa,0)=q:a(pa,1)=s
10790 pa=pa+1
10800 PRINT #3,"Add any more S.Os Y/N ":GOSUB 100:CLS#3
10810 IF x$="Y" THEN CLS:GOTO 10500
10820 FOR jj=1 TO pa-1
10830 FOR j=0 TO pa-jj
10840 IF a(j,1)<=0 THEN FOR q=j TO pa-1:FOR k=0 TO 1:a$(q,k)=a$(q+1,k):a(q,k)=a(q+1,k):NEXT:NEXT:pa=pa-1
10850 IF a(j,1)<=a(j+1,1) THEN 10920
10860 FOR k=0 TO 1
10870 c$(k)=a$(j+1,k)
10880 c(k)=a(j+1,k)
10890 a$(j+1,k)=a$(j,k):a(j+1,k)=a(j,k)
10900 a$(j,k)=c$(k):a(j,k)=c(k)
10910 NEXT
10920 NEXT
10930 NEXT
10940 FOR i=0 TO pa-1
10950 IF a(i,1)>31 THEN pa=pa-1
10960 NEXT
10970 RETURN
10999 REM *** EXAMINE/DELETE S.O.s ***
11000 FOR i=0 TO pa:CLS:PEN 2
11010 IF a(i,0)=0 THEN q$="":GOTO 11290
11020 q$="STANDING ORDERS":GOSUB 440
11030 PEN 1:PRINT#ch,"Payment:";:PEN 2:PRINT#ch, a$(i,0):PRINT#ch
11040 PEN 1:PRINT#ch,"Amount £";:PEN 2:PRINT#ch, USING "####.##-";a(i,0):PRINT#ch
11050 PEN 1:PRINT#ch,"Months Payable ";:PEN 2
11060 FOR j=1 TO 12
11070 IF  MID$(a$(i,1),j,1)="1" THEN PRINT#ch, mo$(j-1);":";
11080 NEXT:PRINT#ch:PRINT#ch
11090 PEN 1:PRINT#ch,"Day of Payment:";:PEN 2:PRINT#ch,a(i,1)
11100 IF CH=8 THEN PRINT#8:PRINT#8:GOTO 11160
11110 PEN 2:PRINT:PRINT"Commands Available:":PRINT
11120 PEN 1:PRINT"ENTER";:PEN 2:PRINT" Next item"
11130 PEN 1: PRINT"'Q'";:PEN 2:PRINT" Quit"
11140 IF PR THEN PEN 1: PRINT"'P'";:PEN 2:PRINT" Output to printer
11150 PEN 1:PRINT"'D'";:PEN 2:PRINT" Delete"
11160 IF ch=8 THEN q$="":CLS:GOTO 11280
11170 q$="":PRINT#3,"Please Select 'ENTER',Q,D ";:IF pr THEN PRINT#3,"or P ";
11180 INPUT #3,"",q$:q$=UPPER$(q$):CLS#3
11190 IF q$<>"" AND q$<>"Q" AND q$<>"D" AND q$<>"P" THEN PRINT CHR$(7):GOTO 11170
11200 WHILE q$="D"
11210 FOR j=i TO pa-1
11220 FOR k=0 TO 1
11230 a$(j,k)=a$(j+1,k):a(j,k)=a(j+1,k)
11240 NEXT:NEXT
11250 pa=pa-1:q$=""
11260 WEND
11270 IF q$="P" THEN ch=8:GOTO 11020
11280 ch=0
11290 IF q$="" OR q$="D" THEN CLS:NEXT
11300 RETURN
11499 REM *** DISPLAY S.O.File ***
11500 CLS:PEN 2
11510 q$="STANDING ORDERS ":GOSUB 440
11520 q=0:WHILE q<1 OR q>12
11530 INPUT #3,"Month No for Standing Orders (1 to 12) ";q:CLS#3:CLS
11540 WEND
11550 PRINT:q$=q$+mo$(q-1)
11560 GOSUB 440 PRINT#ch,STRING$(39,"-")
11570 PRINT#ch,"DAY & DETAILS";TAB(35);"ITEM"
11580 PRINT#ch,STRING$(39,"-")
11590 sosum=0:co=1
11600 FOR i=0 TO pa
11610 d=0:WHILE  MID$(a$(i,1),q,1)="1" AND d=0:d=1
11620 PEN 2:PRINT#ch,USING "## &";a(i,1);a$(i,0);
11630 PEN 2+(1 AND a(i,0)<0):PRINT#ch,TAB(32);USING "####.##-";a(i,0)
11640 sosum=sosum+a(i,0):co=co+1
11650 WEND
11660 IF co MOD 12=0 AND ch=0 THEN GOSUB 300:CLS:PRINT q$;" cont":PRINT
11670 NEXT:PEN 2
11680 PRINT#ch,TAB(32);STRING$(7,"=")
11690 PRINT#ch,TAB(10);"Total for ";mo$(q-1);:PEN 2+(1 AND sosum<0):PRINT#ch,TAB(32);USING "####.##";sosum
11700 IF ch=8 THEN FOR n=1 TO 2:PRINT#ch:NEXT:CLS:ch=0:RETURN
11710 IF pr THEN GOSUB 560:IF x$="Y" THEN 11560 ELSE ch=0:prc=0:co=0:RETURN
11720 GOSUB 300:RETURN
11999 REM *** REM SELECTIVE ENTRIES ***
12000 CLS:CLS#3:q$="SELECTIVE ENTRIES MENU":GOSUB 440:PRINT
12010 PRINT"  1) CREATE SPECIAL CATEGORIES":PRINT
12020 PRINT"  2) ADD TO CATEGORIES":PRINT
12030 PRINT"  3) DISPLAY ENTRIES YEAR TO DATE":PRINT
12040 PRINT"  4) INSTRUCTIONS":PRINT
12050 PRINT"  5) EXAMINE/DELETE ENTRIES":PRINT
12060 PRINT"  6) RETURN TO MAIN MENU":PRINT
12070 INPUT #3,"PLEASE ENTER SELECTION (1-6)";x$:CLS#3
12080 x=VAL(x$)
12090 IF x<1 OR x>6 THEN GOSUB 400::GOTO 12070
12100 IF x=6 THEN RETURN
12110 IF x=3 AND c1<1 THEN GOSUB 420:GOTO 12000
12120 CLS
12130 ON x GOSUB 12500,13000,13500,14000,14060
12140 ch=0:prc=0:GOTO 12000
12150 REM *** CREATE SPECIAL ENTRIES **
12500 IF ct=0 THEN 12550
12510 CLS:PEN 3:LOCATE 16,2:PRINT"WARNING !":PRINT:PRINT:PEN 2:PRINT"CATEGORIES ARE ALREADY ESTABLISHED. IF  YOU CONTINUE ALL OF THESE WILL BE ERASED":PRINT"PRESS Y TO CONTINUE OR N TO RETURN TO   MENU WHERE OPTION 2) SHOULD BE SELECTED"
12520 PRINT #3,"Press Y to continue or N to Return "
12530 GOSUB 100
12540 IF x$<>"Y" THEN RETURN
12550 q$="CREATE HEADINGS":GOSUB 440:ct=0
12560 IF ct>=10 THEN CLS#3:PRINT#3,"FILE FULL ":GOSUB 500:RETURN
12570 INPUT #3,"NAME OF CATEGORY OR 99 TO QUIT       ";y$:CLS#3
12580 IF y$="99" THEN RETURN
12590 y$=UPPER$(y$)
12600 PRINT#3,y$:PRINT #3,"IS THIS CORRECT Y/
```

```
N ?":GOSUB 100
12610 IF z$<>"Y" THEN 12570
12620 ct=ct+1:ct$(ct)=y$
12630 PRINT USING"##) &";ct;+ct$(ct)
12640 GOTO 12560
12999 REM *** ADD HEADINGS ***
13000 CLS:q$="ADDITIONS TO HEADINGS":GOSUB 44
0
13010 FOR n=1 TO ct
13020 PRINT USING"##) &";n;ct$(n)
13030 NEXT
13040 GOTO 12560
13500 CLS:REM *** YEAR TOTALS ***
13510 q$="YEAR TO DATE TOTALS":GOSUB 440
13520 FOR n=1 TO ct
13530 PEN 2:PRINT#ch, USING "##) &";n;ct$(n);
:PRINT#ch,TAB(32);:PEN 2+(1 AND spend(n)<0):P
RINT#ch, USING "####.##-";spend(n)
13540 NEXT:IF prc THEN 13570
13550 IF pr=0 THEN GOSUB 300 ELSE GOSUB 560
13560 IF ch=8 AND prc THEN 13510
13570 ch=0:prc=0:CLS:PEN 2:RETURN
14000 q$="INSTRUCTIONS FOR SELECTIVE ENTRIES"
:GOSUB 440
14010 PRINT"The purpose of this section is to
 keep  a running total of expenditure within
  named sections for example Electricity, Tel
ephone,credit cards etc.
14020 PRINT: PRINT"You may enter a maximum of
 eighteen suchsub-sections and once having na
and themeentries in the INPUT DATA section th
ey  must conform to the specified entry.
14030 PRINT:PRINT"You may not change the entr
ies after    setting up although you may add
to the  categories at any time up to the limi
t  of eighteen although any expenditure    be
fore this time will be ignored unless deleted
 and re-entered.
14040 GOSUB 300
14050 RETURN
14060 CLS:CLS#3
14500 q$="SPECIAL CATEGORY ENTRIES":GOSUB 440
14510 FOR n=1 TO ct:PRINT USING "##) &";n;ct$
(n):NEXT
14520 INPUT #3,"Enter number of entry to be d
eleted     or ** to QUIT  ",z$
14530 IF z$="**" THEN RETURN
14540 z=VAL(z$):IF z>ct THEN GOSUB 400:GOTO 1
4520
14550 CLS#3:PRINT#3,z;ct$(z)
14560 INPUT #3,"Is this the correct entry Y/N
";z$
14570 IF UPPER$(z$)<>"Y" THEN CLS#3:GOTO 1452
0
14580 FOR n=z TO ct:ct$(n)=ct$(n+1):spend$(n)
=spend$(n+1):NEXT:ct=ct-1:GOTO 14060
14590 RETURN
15000 CLS:CLS#3:PRINT"The program will hold u
p to 60 entries  in each month and will handl
e all trans-actions for a full 12 month perio
d.
15010 PRINT:PRINT"Up to 20 Standing Orders wi
ll be posted to the Account on the correct da
te. SOs may be at any frequency and can also
be changed during the course of the year.
15020 PRINT:PRINT"Up to 18 categories of expe
nditure may  be named and year to date totals
 in eachwill be accurately recorded.
15030 PRINT:PRINT"Facilities are included for
 reconcilla- tion with your Bank Statement an
d outputcan be sent to a printer wherever thi
s  is appropriate.
15040 GOSUB 300
15050 PRINT"It is recomended that the Standi
ng     Orders file and the Special Expenditur
e categories are created before any data  is
entered.
15060 PRINT:PRINT"When used with Disc Drive,
Frequent use should be made of the 'SAVE DATA
' -     OPTION 7 on the main Menu.
15070 GOSUB 300:RETURN
20000 ch=0:RESTORE 1170:FOR i=0 TO 11:READ mo
$(i):NEXT:GOTO 2000:REM ** goto this line to
restart if the program is broken **
30000 SPEED WRITE 1:SAVE "BANK":GOSUB 9000:GO
TO 20000:REM *** AUTOSAVE ***
```


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We are always actively seeking programs for publication – either for Open Forum the machine pages or Star Game. When sending in a program for consideration, a clear program listing should be sent, together with, wherever possible, a saved copy on cassette. Documentation – usually not more than 1000 words – should start with a general description of the program, what it does, and then some detail of how the program itself is constructed. We pay very competitive rates, according to the length and nature of the program and the quality of the accompanying documentation.

Header

on Spectrum

This machine code routine, for Interface 1 owners, adds an extra command to ZX Basic, using the shadow system variable *Vector*. The new command **D*, will give details on any microdrive file, in a similar way to cassette 'header reader' programs. The command takes the format **D.x s,s,s* where x is the drive number (optional – leave out '.x' and 1 is assumed) and s is either (a) a channel specifier (eg #4) or (b) a filename. For example, the command might read **d 1,"prog","test"#4 'prog2"*

The details printed are, for a *Print* file, only that it is a *Print* file, for any other file (Basic, Bytes or Array), file length and start address, for a Basic program, the program length and auto-start line, and for a variable array, the array name.

To enter the program, either use an assembler or type in the hexloader, enter *F000* as start and *F220* as the finish, and type in the bytes from the hex listing. You may type in up to eight bytes in each input (do not separate with spaces), but leave out the checksums until you are asked for them, after every eighth byte.

Then save the code: type, *Save *"m";1,"*D code" Code 61440,552*. To set up the new command *Poke 23735,0:Poke 23736,240*

```
1 DEF FN B(A$)=CODE A$-48-7*(A$>"9")
2 DEF FN H(A$)=FN B(A$(1))*16+FN B(A$(2))
3 DEF FN B$(A)=CHR$(A+48+7*(A>9))
4 DEF FN H$(A)=FN B$(INT (A/16))+FN B$(A-16*INT (A/16))
5 POKE 23658,8 :REM CAPS LOCK ON
10 INPUT "START?";LINE A$:LET START=FN H(A$)*256+FN H(A$(3 TO))
15 INPUT "FINISH?";LINE A$:LET FINISH=FN H(A$)*256+FN H(A$(3 TO))
20 FOR A=START TO FINISH STEP 8
25 PRINT FN H$(INT (A/256));FN H$(A-256*INT(A/256));
30 LET C=0
40 INPUT LINE A$:LET A$=A$+" "
50 FOR G=0 TO 7:IF A$(1)=" " THEN INPUT LINE A$:LET A$=A$+" "
60 LET Z=FN H(A$):LET A$=A$(3 TO):POKE A+G,Z:PRINT " ";FN H$(Z);:LET
C=C+Z
70 NEXT G:INPUT "CHECKSUM:";LINE A$:IF FN H(A$)<>C-256*INT (C/256)
THEN PRINT "CHECKSUM INCORRECT":GO TO 25
80 PRINT: NEXT A
```

The Music Box



Use of noise

A letter from Martin Unsworth of Hampshire comments that the Music Composer program for the Amstrad came as something of a disappointment. I've had an opportunity to play around with this Kuma package and reluctantly, I'm forced to agree with Martin. The program is fundamentally flawed.

The most obvious failing is the program's inability to deal with more than one sound channel or voice. The so-called 'mixer' section of the program is therefore a misnomer – while it enables separate monophonic sequences to be strung together end on end, there is no facility for creating a polyphonic sequence.

As Martin Unsworth notes, the program barely 'scratches the surface of the Amstrad's music making capabilities'. Apart from the lack of multiple voices, there are no facilities for enveloping or the use of noise. That said, the program's existing features are impressively implemented – clear and easy to use with graphics almost the match of those on the old Atari Music Composer package. A useful introduction to computer music for the Amstrad owner.

Martin Unsworth writes that he would 'be very interested to hear of any more comprehensive software packages that are in the pipeline'. Well, so would I... so if there's anyone from Amstrad out there, drop me a line.

Talking of which, Kenneth Davidson of Fife has written a letter to be passed on to an earlier correspondant, D Tatam, also the proud owner of a CPC64. Kenneth says that he's writing an envelope shaper/sequencer 'to take up to 200 notes on each channel' – which sounds interesting. He's also got a Datel Sound Sampler for the Spectrum, but notes that he's had to rewrite the software. I wonder if anybody else has had problems with the Datel software, because this is not the first such comment I've received.

The rest of the letter deals with other matters which, incidentally, reveal – as did the recent *Popular* competition – that the level of involvement among those of our readers interested in computer music is very high.

I'll be getting round to the competition entries in due course. For now, I'll just say that they were of a generally high standard and it's very nice to hear the evidence of so much micro-musical talent.

Gary Herman

The Music Box is a weekly column with news, reviews and readers comments on all aspects of micros and music.

Any readers with experience of computer music making or companies with new product news are invited to write to drop a line explaining what they're doing to Gary Herman, The Music box, 12-13 Little Newport Street, London WC2H 7LD.

HEX FOR MICRODRIVE 'HEADER READER', WITH CHECKSUMS

F000	FE	5C	C2	F0	01	D7	20	00	=04	F110	F1	CD	28	2D	CD	E3	2D	3A	=20
F008	F6	20	FE	64	20	F4	3E	02	=CC	F118	AA	F1	A7	20	36	3E	02	11	=E9
F010	32	B3	F1	D7	20	00	FE	2E	=F9	F120	D5	F1	CD	0A	0C	CD	4D	AD	=8E
F018	28	07	DF	28	20	3E	01	18	=AD	F128	F1	CD	28	2D	CD	E3	2D	11	=04
F020	0C	D7	20	00	D7	82	1C	DF	=57	F130	D5	F1	3E	03	CD	0A	0C	ED	=D7
F028	28	13	D7	14	23	4F	06	00	=9E	F138	4B	AB	F1	03	78	B1	08	28	=46
F030	ED	43	D6	5C	18	07	D7	8C	=E4	F140	08	CD	28	2D	CD	E3	2D	18	=22
F038	1C	DF	C4	62	F0	D7	18	00	=00	F148	20	11	D5	F1	3E	06	CD	0A	=12
F040	FE	3B	20	18	D7	20	00	FE	=66	F150	0C	18	16	FE	03	28	12	11	=86
F048	23	20	E8	D7	20	00	D7	B2	=7E	F158	D5	F1	3E	05	CD	0A	0C	3A	=26
F050	1C	DF	28	E9	D7	14	23	32	=4C	F160	AD	F1	D6	40	CB	7F	20	08	=26
F058	B3	F1	18	E1	CD	B7	05	C3	=E9	F168	D7	3E	0D	D7	FB	E1	D9	C9	=77
F060	C1	05	D7	F1	2B	21	0A	00	=E4	F170	D6	40	D7	3E	24	18	ED	AF	=03
F068	A7	ED	42	DA	4C	06	ED	43	=32	F178	CF	21	FB	DD	E5	3A	B3	F1	=8D
F070	DA	5C	ED	53	DC	5C	D7	7A	=FF	F180	CD	01	16	11	D5	F1	3E	04	=FD
F078	F0	C9	D9	E5	D9	CF	22	DD	=1E	F188	CD	0A	0C	DD	E1	DD	E5	CD	=30
F080	C8	18	46	28	0A	AF	CF	21	=FA	F190	9B	F1	DD	E1	CF	2C	18	D1	=2B
F088	CF	2C	FB	D9	E1	D9	C9	DD	=2F	F198	DD	E5	D1	21	0E	00	19	EB	=C6
F090	22	51	5C	E1	DD	CB	43	56	=F1	F1A0	01	0A	00	CD	3C	20	3E	0D	=7F
F098	CA	77	F1	CD	E6	15	32	AA	=D6	F1A8	D7	C9	00	00	00	00	00	00	=A0
F0A0	F1	CD	E6	15	32	AF	F1	CD	=58	F1B0	00	00	00	00	80	50	72	6F	=B1
F0A8	E6	15	32	B0	F1	CD	E6	15	=96	F1B8	67	72	61	6D	3A	A0	23	41	=E5
F0B0	32	B1	F1	CD	E6	15	32	B2	=80	F1C0	72	72	61	79	3A	A0	24	41	=FD
F0B8	F1	CD	E6	15	32	AD	F1	CD	=56	F1C8	72	72	61	79	3A	A0	42	·79	=53
F0C0	E6	15	32	AE	F1	CD	E6	15	=94	F1D0	74	65	73	3A	A0	80	4C	65	=57
F0C8	32	AB	F1	CD	E6	15	32	AC	=74	F1D8	6E	67	74	68	3A	A0	0D	53	=EB
F0D0	F1	AF	CF	21	FB	DD	E5	3A	=87	F1E0	61	76	65	64	20	66	72	6F	=07
F0D8	B3	F1	CD	01	16	3E	0D	D7	=AA	F1E8	6D	3A	A0	0D	50	72	6F	67	=EC
F0E0	11	B4	F1	3A	AA	F1	CD	0A	=62	F1F0	72	61	6D	20	6C	65	6E	67	=06
F0E8	0C	DD	E1	DD	E5	CD	9B	F1	=E2	F1F8	74	68	3A	A0	0D	41	75	74	=ED
F0F0	DD	E1	CF	2C	11	D5	F1	AF	=3F	F200	6F	2D	73	74	61	72	74	3A	=04
F0F8	CD	0A	0C	ED	4B	AF	F1	CD	=88	F208	A0	0D	50	52	49	4E	54	20	=5A
F100	28	2D	CD	E3	2D	3E	01	11	=85	F210	66	69	6C	65	3A	A0	0D	41	=CB
F108	D5	F1	CD	0A	0C	ED	4B	B1	=92	F218	72	72	61	79	20	6E	61	6D	=1A
										F220	65	3A	A0	4E	6F	6E	65	A0	=6F

Header
by P Rhodes

Book Ends

Book *Compute!'s Commodore Collection (Vols 1 & 2)* **Price** £10 **Micro** Vic & C64 **Supplier** Holt Saunders 1 St Anne's Road, Eastbourne East Sussex BN21 3UN

Listings collections usually totally underwhelm me, but these two volumes, from America's respected *Compute!* magazine, stand clear of the mass.

Instead of concentrating on plodding Basic arcade games they cover education, sound and graphics, utilities, programming aids, applications, and there are some novel and ambitious projects, such as a Chess program and a French translator (Vol 2) and a Data Handling Workshop (Vol 1)

Presentation is excellent – clear print and spiral bindings, with lavish appendices and even indexes! The only drawback is the price, which is compounded by most programs having versions for both micros, effectively halving the space. However, Commodore owners often have to pay dearly and Volume Two could be worthwhile

John Minson

Book *Learning Forth* **Price** *£17.60* **Micro** *Any* **Supplier** *John Wiley and Sons Limited Baffins Lane Chichester, West Sussex PO19 1UD*

This introduction to *Forth* is described as a self teaching guide, which means that every paragraph is followed by a question

Q What is a self teaching guide?

A. Very much like this

It's a novel approach and presumably educationally sound as it reinforces every point before the reader can continue

However, it does rather resemble the rote learning of primary schools, though the payroll program developed over the last chapters is far from juvenile

Another possible problem is insufficient discussion of the language's various dialects, though the book is well appendixed and indexed. It's an attractive volume which even breaks the back of stack handling quite painlessly, if you don't mind the drill aspect

John Minson

Arcade Avenue



Headed up

This week we are continuing with details on how to get pokes in past Spectrum turbo loaders. At the top of the page you will find a short listing from Paul Miller of Hednesford which is a very useful utility indeed. It allows you to produce a new header for any Spectrum program to prevent it from auto-running. I advise you all to keep hold of this routine because we will probably refer to it many times over the next few weeks for various games.

Simply follow the prompts to produce your new header, then run the program, insert the original game and save the new header onto a blank tape. You should then reset the computer by typing *RANDOMISE USR 0*.

Now follow these steps to get the desired effects for *Underwurlde* and *Knightlore*.

Underwurlde – type *CLEAR 40000 LOAD ""*. Play the new header, followed by the original tape which has been wound past its own header. When the OK message appears stop the tape. Type *POKE 24791, 251 POKE 24792, 207 RANDOMISE USR 24740*. Ignore the error message that appears and type *NEW*. Then from 62421 onwards poke the following numbers for infinite lives *62, 0, 50, 240, 231, 50, 244, 231, 195, 242, 103*, or to stay immortal after finding a gem *62, 0, 50, 153, 148, 50, 154, 146, 195, 242, 103*, or to make weapons appear in the same place each game *33, 0, 50, 189, 232, 195, 242, 103*; or for no enemy in game *62, 201, 50, 216, 175, 195, 242, 103*. Finally, *RANDOMISE USR 62374* to start the main code loading.

Knightlore – type *CLEAR 40000 LOAD ""* as above. When OK appears *POKE 24745, 251 POKE 24754, 231 POKE 24782, 207 POKE 24793, 143 RANDOMISE USR 24744*. Ignore error, *NEW* and you can enter your routines at address 62425 onwards. However, since there are a lot of things to do on this game, it will probably be simplest if you just type *POKE 62425, 251 POKE 62422, 201 RANDOMISE USR 62374*. This will load in the main block of code and dump you back into Basic.

Once this is done, *POKE 53567, 0* will give you infinite lives, *POKE 50064, 201* will stop metamorphosis. *POKE 50206, 0* will give indefinite days or *POKE 49759,n* where n is the number of objects to be collected. If you also *POKE 54562, 155 POKE 54563, 105 POKE 54564, 175* it will allow you to restart a game by pressing the pause key which is useful if you have infinite lives. *RANDOMISE USR 24832* will start the game.

However, if you want to see something really special enter this following short routine *FOR N = 26796 TO 26813 INPUT A: POKE N,A: NEXT N* (enter) then enter these numbers in turn – *7 154 162 155 163 156 165 157 166 64 220 29 2 74 146 5 77 149*. Room location J16 (on your map of Vol 4 issue 4) will have been redesigned! If you want to redesign room G14 enter the above routine again, but change the values of N to 26274 – 26289 and type these numbers *171 155 156 163 164 31 19 20 43 44 75 76 115 116 24 76*. For room K4 let N = 26822-26842 and type *2 12 21 43 1 155 196 0 45 43 62 95 106 106 104 34 59 11 12 75 76*.

This information is the result of some brilliant work by Neal Goodwin and Tony Jones of Wrexham. Neal cracked *Knightlore's* loader using a routine similar to that above. Tony found that by poking low addresses he could change room layout and together they unravelled the way that the program works. The rooms are stored from address 25176 onwards. Each one is of variable length – the room description is first followed by the room number, codes that control exits, colours, size of screen, etc, and finally the code 255 after which the data starts for the next room. These last numbers can crash the game if changed or wiped out so you must be careful. Peek the code from 25176 on and look for the room numbers which start at 1 and increase by one for each room.

To understand how the layouts work and design your own rooms, imagine the screen is like a chess board split into 64 squares numbered from 0 to 63. Square 0 is at the corner on the far left half way up the screen and they continue from 0 to 7 down the lower left hand edge to the bottom middle corner. The next row runs parallel to this numbered 8 to 15. The final row goes from top middle corner to the corner at the far right of the screen numbered 56 to 63. On top of this chessboard are 3 more – each level is represented by adding 64 to the one below.

Each object is represented by these figures: 0 solid block, 28 jungle block, 199 collapsing block, 126 mobile block, 40 impaler, 32 gargoyle, 48 chest, 56 table, 208 portcullis top to bottom, 216 portcullis bottom to top, 200 magic spell, 184 roving ball, 72 ghost, 104 knight, 64 opposite direction knight; 16 bouncing ball, 176 exploding block, 152 falling spike. 111 and 121 are codes for moving blocks, but slow the game down and are best avoided. To each object number you must add 1 for every extra one you want, then follow it by the locations you want them printed, eg. 59 (4 tables – 56 + 3) 19 20 35 36 (print them at squares 19, 20, 35, and 36).

Don't worry if it sounds complicated – follow our examples through and you will soon get the hang of it.

Tony Kendle

```
10 REM TO COPY HEADER BLOCKS
   OF PROGRAMS SO THAT THEY
   DO NOT AUTO-RUN
20 FOR A=60000 TO 60025
30 READ B: POKE A,B
40 NEXT A
50 CLS : PRINT AT 1,1; "INSERT O
RIGINAL GAME AND PRESS PLAY"
60 RANDOMISE USR 60000 : REM TO
LOAD HEADER
70 PRINT AT 10,1; "HEADER LOADED
"
80 POKE 32014,128
90 PAUSE 200
100 CLS : PRINT AT 1,1; "INSERT
BLANK TAPE TO COPY HEADER ONTO"
110 PRINT AT 21,1; "START TAPE A
ND PRESS ANY KEY"
120 IF INKEY$="" THEN GOTO 120
130 RANDOMISE USR 60014 : REM TO
 SAVE NEW HEADER
140 PRINT AT 10,1; "NEW HEADER S
AVED"
150 STOP
1000 DATA 221,33,0,125,17,17,0,6
2,0,55,205,86,5,201
1010 DATA 221,33,0,125,17,17,0,2
75,205,194,4,201
```

We are searching for the top UK computer games player – the best there is!

The very best of Britain's game players will get to fight it out on a number of top secret new games – scheduled for release in the autumn.

Here's how it works

Study the table below and look at the column for the machine you have – these are the games you'll need to master. Send your high scores in on the form below making sure that your scores are authenticated by a responsible individual signing the form. Any scores achieved using technical short cuts – such as infinite lives Pokes – will not be accepted.

Between now and September Tony Kendle will be keeping you up to date on the *Arcade Avenue* page with just who has the scores to beat. Then in September the top three scorers on each machine will battle it out for a place in the final and the chance to be the first to play our 'top secret' games.

	Commodore	BBC	Spectrum	Amstrad
Game 1	Suicide Express	Elite	Technician Ted	Sorcery
Game 2	Beach Head	Jet Pac	3D Star Strike	Splat!
Game 3	Shoot the Rapids	Chuckie Egg	Cyclone	Manic Miner

Game Wizard Entry Form

Micro

Game 1 score

Game 2 score

Game 3 score

Name

Address

Your signature

Witness's signature

Tony Bridge's Adventure Corner



Adventure-racers

Looking back to last week's Corner, where I mentioned The Adventurer's Club, I see that I overlooked the address and phone number – a day in the stocks is obviously called for! Contact the club at: 64c Menelik Road, London NW2 3RH (tel 01-794 1251).

During the life of the Corner, there have been several games that have caught the imagination of the 'adventure racers' – those who race to try to complete an adventure before anyone else *The Hobbit* with its percentage score was a favourite (remember the *Hobbit* Hall of Fame), and the *Lords of Midnight* series also brought forth a lot of 'I got there first' mail

Now, we have another, *Shadowfire* Two letters landed on my desk from players who both claimed to be first in completing Beyond's new program.

Unfortunately P Strowger finished the game on Tuesday, 30 April

Although he was kind enough to send me a tape proving his achievement together with several invaluable tips, I'm afraid that Steve Ford wrote to me to say that *he* finished on Sunday 28 April

Steve is a little disappointed by the final congratulations – in fact, just one word, and that's it! 'But,' he says, 'this pales into insignificance when you realise just how great the game is I consider it an honour to be able to play such adventures and Beyond deserve to be made the Gods of Adventuring (yes, even before Infocom!)' Strong words, Steve, but I admit that Beyond have done an awful lot to bring adventures to a wider audience and they deserve every success

The Grand Elf received another letter, written the 2nd of May, from Harry Wright of Preston. He didn't claim to be the first to finish *Shadowfire*, and didn't complain about the small congrats, but nevertheless, he has finished, and has passed on a few tips, for this program and *Valkyrie 17*, from Ramjam

In *Valkyrie 17* to get the Diamond 36,11 and to finish the game (there's a good hint for you!) 31,20,1 17

Further to our discussion of *Zkul*, the QL adventure from Talent, Jeff Tope writes to me from Exeter University with some observations about the program – and yes, Jeff, I'd love to see the map you have made Among other things, he sys 'When in the North side of the Centre Chamber, try 34,7 In the Tcobas location 28,14 I'm sure that Jeff won't mind me giving out his address, for those QL adventurers who may be stuck in *Zkul* (you will, of course, include a SSAE) Room L410, Cornwall House, St Germans Road, Exeter University, Exeter EX4 6TG

Earlier this week I mentioned *The Hobbit*, but the name doesn't often crop up nowadays

Of course new adventurers are coming along all the time and discovering the delights of this classic program and it isn't easy to know where to go for advice apart from combing the back copies of Popular and the Corner Melbourne House themselves have published a book of hints (by David Elkan, at £3 95), as has Duckworth (The Old Piano Factory, 43 Gloucester Crescent, London NW1), in their *Adventurer's Companion*, by the disgustingly prolific Gerrard Brothers

However Mark Carleton of Dublin has obviously not read either of those books, or (shock, horror) been paying attention to the Corner 'I have got to Gollum but when I talk to him, I always get strangled from behind I am also stuck at the Black River, how do I get into the boat? The best thing to do with, Gollum is 24,4,5! If you decide to have a go you must be sure of your replies – if the little blighter follows you, then you may 22,5 19,15,12,27 To get the boat, 25 10,18 Then 37 and 23,30,16 At the other side you must, of course 23,8

Nigel Hurll is having trouble in, – guess where – the Goblin's Dungeon, the stumbling block for many of us adventurers Take heed of the clue Nigel, and enlist the help of a friend. Wait around for Thorin of Gandalf to arrive, and than say 25,9 – now you can say 36 2 After this, what you do depends on who you have called on for help Another adventure which is troubling Nigel is Phipps' *Pharaoh's Tomb*, one of the earliest for the Spectrum To get out of the ice cavern, you need to melt the ice somehow You will have need of the candle from the storeroom, and the matches The matches, however, have an unfortunate habit of bursting into flames, when you go through the fire room You must, therefore, carry something which will temporarily nullify the effects of the heat – 25, 29, 6 is the solution, but you must leave the matches near the front entrance and return for them later properly equipped You ll find that Death Tunnel will lead you back to the entrance – but you will be killed on *sight* (hint, hint) As for the maze, here is the route through, from death row 21, 3, 3, 33, 21, 21 Soon after leaving the Maze you'll come across a closed door (this is the source of the 'rumbling noise' that you will have heard if you pulled that lever in the control room) the door only stays open for a limited amount of moves so map the route carefully It's a good adventure, with some tough problems, the only problem being the painfully slow drawing of the 1983-vintage pictures

Andy MacGregor, a hapless refugee from *MicroAdventurer*, has completed a huge number of adventures, including titles from Level 9 Interceptor, Artic, Phipp Quicksilva's *Velnor Lair* and others too numerous to mention He offers help to anyone stuck in these – but he needs help in *Witches Cauldron* (how to get past the Dragon and how to get through the fire to get the pencil), and also in *The Sandman Cometh* (how to get the gun which is chained to the counter) I can't help here, so maybe another reader can enlighten Andy – and, in the case of *Sandman* if anyone can supply a map or solution, I would be grateful Andy MacGregor, 12 Douro Close, Baughurst, Basingstoke, Hants RG26 5PG

1 TO 2 WINDOW 3 WEST 4 ANSWER 5 HIM 6 ICE 7 TASSOC 8 OUT 9 ME 10 ROPE 11 PEDESTAL 12 SHORT 13 NORTH 14 TWICE 15 THE 16 BOAT 17 BARMAN 18 ACROSS 19 WITH 20 DIAMOND 21 SOUTH 22 KILL 23 CLIMB 24 DON'T 25 CARRY 26 DIG 27 SWORD 28 THROW 29 THE 30 INTO 32 GIVE 32 YOUR 33 EAST 34 SAYING 35 SHAKE 34 OPEN 37 PULL 38 RIDDLES

Adventure Helpline

Going bananas? If you are stuck in an Adventure with nowhere to turn do not despair – help is at hand

Fill in the coupon explaining your problem send it to us and a fellow adventurer may be able to help

Remember – the system only works if those adventurers who have solved the puzzles get in touch Every week is Save An Adventurer Today (SAAT) week!

Adventure .... on (Micro) ....
Problem ....
Name ....
Address ....

This series of articles is designed for novice and experienced Adventurers alike Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter So if you have an Adventure you want reviewed, or if you are stuck in an Adventure you cannot progress any further write to Tony Bridge Adventure Corner *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD



Comma change

Ian Roulton of Bristol, writes

Q I have a Dk'tronics keyboard for my Spectrum and I need to enter lots of data. The separate numeric keypad is very handy, but its value is spoilt by having to shift to get a comma. Is it possible without much fuss to redefine the full stop on the numeric pad as a comma as a temporary measure?

A The best way of achieving what you require is to redefine the character set in Ram (in a similar way to that used for user defined graphics) All you need to do is to change the positions of the comma and full stop in the new character set That will give you the effect you require If you are using commercial software you will unfortunately still have a problem in getting the software to pick up your new character set. It is not possible to redefine the character set in any way that is 'permanent', ie, not overrideable by a commercial program.

Range of values

J Cunningham of Glasgow, writes

Q The QL manual states that *Val* is not required in Superbasic, and while it is possible to enter:
x = 5 : x$ = x*x : *Print* x$ (answer 25), there is no way that I can find of inputing a range of x values, *Inputing* a fraction and then calculating the set of y values within a loop in order to plot a graph. Would you please help?

A Well, this is not actually Superbasic, but it works

```
10 Print 'Define function'
Print 'What is highest power of x?'
20 Input p . Dim c(p + 1)
40 For i = p to 0 Step -1
50 Print 'Input constant for x↑',i
60 Input c(i + 1) Next i
70 Print 'Input no of entries required' Input e . Dim y(e) Dim x(e) For i = 1 to e
80 Print 'Input value for x' Input x(i) Let v = 0
90 For j = 0 to p
100 Let v = v + (c(j + 1) * (x(i)↑j))
110 Next j Let y(i) = v Next i
120 For i = 1 to e : Print 'Value of x = ';x(i),' value of y = ',y(i)
130 Next i
```

Book help

Peter Baillie of West Lothian, writes

Q Can you help me in obtaining a book called *The Jupiter Ace*? I have had no luck in obtaining it anywhere . . . please, please help!

A Two addresses to try: Mine Of Information Ltd, 1 Francis Avenue, St Albans AL3 6BL, or John L Noyce, Publisher & Information Consultant, PO Box 450, Brighton BN1 8GH.

Illegal line number

Dave Hood, Newcastle-upon-Tyne, writes

Q Whilst examining the introductory basic insides on a piece of commercial software, I was mystified to find what should have been an illegal and unallowable line number. As you know the Spectrum allows line numbers between 0 and 9999. The line in question was numbered :243 (the colon was part of the number). Not only does this break the syntax rules, but after typing in the line 9999 *Rem*, I was surprised to find that :243 was still the last line in the listing. This line could be edited, but could not be entered. Obviously I am most curious to know how the offending line number could have been entered and accepted in the first place, I would also like to know how this illegal number can be removed from the program altogether.

A As you rightly point out :243 is an invalid line number on the Spectrum, and cannot therefore be entered directly You are incorrect, however, in stating that the Spectrum allows line zero It does not! Lines with strange numbers like zero or :243 can only be entered with normal numbers (set to place them in the correct position in the program), and then *Poked* with their new (uneditable) value. In order to change this line number it is only necessary to find out at which memory location it is stored, and *Poke* that address (well addresses actually) with the value that you desire (preferably numeric) The line can then be edited in the normal way (or even deleted). This practice of changing line numbers (particularly to zero) is quite commonplace in commercial and home written software, although usually the number chosen is not quite so unusual!

One last point, the line number is not syntax checked when the line is executed, only when it is entered or edited. That is why you get no problems when running such programs.

Detection method

Simon O'Neill of Hornchurch, Essex, writes

Q I have been programming my Spectrum in Basic and have come across the following question; when a user defined character is displayed on the screen is it possible to determine whereabouts it is? I know that you cannot use *Screen$* so I wondered if there were any other methods.

A The actual method of detecting a UDG on the screen is to use *Screen$* I know what you are going to say, that that does not work, well . . .

If you use *Poke* 23606, 56 *Poke* 23607, 254 and then *If Screen$*(x,y) – *Chr$*(z) *Then* - - -

You will be able to detect UDG's in the same way as any other character

X and y are the coordinates of the character position you are interested in Z is the *Udg* that you wish to test for (the first udg is *Chr$*(32)) After carrying out the *Udg* testing you will need to reset the character set pointer that was moved by the earlier *Pokes* (that is what enables the *Screen$* to work)

This is done by *Poke* 23606, 0 *Poke* 23607, 60

Compatible printer

Jeff Rogers of Warley, writes.

Q I am soon going to purchase a printer for my Spectrum to help with letter writing, etc. There is one I have in mind: the Brother EP-22.

I am told that this has an RS-232C interface that is compatible with the Spectrum. I would be grateful for your help.

A There is no problem in using the EP-22 printer with the Spectrum. It does indeed possess an RS232 interface which allows you to connect it to a Spectrum, when you have obtained the Spectrum RS232 interface (from Sinclair)

This is obtainable from most branches of Smiths, Boots and the other retail outlets for Sinclair products. You should not experience any problems in obtaining the right sort of connections for the printer cable from a good computer shop

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Phil Rogers and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, *PCW*, 12-13 Little Newport Street, London WC2R 3LD

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CBM 64 1520 printer plotter 1541 disc drive datasol Simon's Basic, Easy Script Books s/w (all originals) sell £400 ono Tel 01 907 9572

For Sale

ADNY MSX HIT BIT MICRO £1 or £60 4 software value £350 Sell for £230 Tel 06827 84152

EPSON HX20 with 16K expansion Ram micro cassette drive and printer 2 games cassette also spare rolls of paper £350 ono Tel Mr harris 01-855 6687 or 0304 813158

ORIC ATMOR 48K some software £60 Tel Southport (0704) 25167

ORIC ATMOS 48K plus Ovdr £100 of software and books All only 3 months old offers invited (no splitting) Ray Tel Leeds 436331

FOR SALE Issues 1 24 of the Home computer course worth £20 but sell for £8 Fast sale wanted Stevyn Tel shoeness 664009

SINCLAIR ZX81 16K RAM pack (boxed) £10 ono Tel Boldon 372943

AMSTRAD CPC464 and colour monitor plus 4 games and other cassettes plus mags £260 Tel 061-881 9775 between 5 and 7pm and ask for Derek

BBC B + SOFTWARE loeds and manuals and speech synthesiser + 48K Spectrum S/W and manuals 50/60 mags £50 worth of BBC books £450 the lot. Raymeah Tel 01 553 3571

AMSTRAD CPC 464 GAMES Roland on the Ropes Hunchback Brand new both £4.50 each Send name address and money to M Sullan 109 Cranham Drive Warndon Worcester WR4 9PQ

AMSTRAD GAMES Jewels of Babylon Roland in Caves Manic Miner either swap or sell Sorcery wanted Please contact Richard on Romsdenium (070682) 2025

FOR SALE Currah speech complete with demo cassette boxed hardly used Price only £17 M Davies Tel Heywood 624970 after 5pm

SINCLAIR QL Recent model £250 Alphacome 81 printer plus parallel interface for the Acorn computer £96 the two Tel Banbury 51097

AMSTRAD CPC464 with colour monitor includes software (sorcery Hobbit etc) and joystick £360 Tel Lingfield (0342) 834705 after 5pm (Surrey)

AMSTRAD 464 colour computer and DDI disc drive with software books joystick, DK Tronic speech unit. Worth over £900 accept £450 stark. Tel 010947 8158 Wandsworth London

CALCULATOR Casio FX451 with 3/4 scientific and logic functions including Hex decimal binary functions Never used hence as new condition only £17 Tel 0325 312417

AMSTRAD ORIGINALS for sale Bottle for Miway £6.50 Detective S D Sneak or Blagger Star commando £5 each Tel 010828 4221 ask for Michael

KOALA PAD A on the last one swap for C64 hardware peripherals or intelligent software considered equivalent value Tel 0248 353346

FOR SALE £50 worth of software including Tir Na Nog and The Quill for £30 Write to T Williams 81 Brigafn Drive Grantham Lincs NG31 9JZ

ADVENTURERS! Valhalla and the Hobbit The classic Spectrum adventures Originals complete with manuals inc £12 for both Offers to A Wiseman 464 Mayfield road Hertford Huntingdon Cambs PE16 7NJ

AMSTRAD SOFTWARE Manic Miner Blagger Cheename Mat and Roland in The Caves (all originals) £4 each Tel 059 566 384 after six

AMSTRAD CPC464 with colour monitor + s/w £230 Tel 0702 334590

ORIC ATMOS 48K Four years guarantee plus £170 worth of books plus two games free Accept £45 for the lot Joe Tel 01 578 2535 (London)

AMSTRAD DOT MATRIX PRINTER unused with guarantee £140 Tel 0454 772653 (Bristol area)

SHARP MZ700 integral tape recorder, speech synthesiser Over £150 software including Pascal Forth machine code Basic compiler utilities adventures games also several books £220 ono Tel Bedford 857345 evenings weekend

SINCLAIR QL six months old £310 Jonathan Tel 0744 51737

SINCLAIR QL FOR SALE used once only Latest S/W and 4 blank cartridges £330 ono Brian Tel 01-662 4690

AMSTRAD COLOUR B/W Boxed perfect full guarantee Tasword logo Devpack Manic Sorcery Fortes / Manages American Football Adventures offers All originals worth over £580 sell £300 ono Tel 01 588 5850 ex 3302 9-5pm

AMSTRAD CPC464 green screen 8 months old perfect condition TV modulator joystick manual 11in software tapes £195 complete Richard Tel Wokingham 0734 780932

AMSTRAD CPC464 colour, perfect condition with Tasword Hisoft assembler and selection of games Upgrading to 16 bit business machine so all available for £290 Tel 0428 712632 (Headley Hants)

AMSTRAD ORIGINALS return to Eden £5 Gilligans Gold £4 as new Also Cheetah Speech Synth for Spectrum £10 as new Tel 0635 57128 after 5pm

CHESS COMPUTER cost £35 accept £12.50 Amber dot matrix printer cost £115 accept £40 (lead available for CPC464) Manic Miner for Amstrad £3 all in excellent condition Tel (0902) 725782

AMSTRAD SOFTWARE and books including Snooker Blagger Hunchback etc All originals. Games and education at 16 titles at 40% original cost. Tel 0255 614523

SHARP MZ80K plus software £130 ono CGLM5 plus FALC plus printer cable £50 ono M P Volsing Tel 0480 75036

AMSTRAD CPC464 + green screen monitor + disc drive including C/PM and utilities on disc Worth £450 sell for £300 Very good condition Tel 01 606 78614 after 5pm (London)

QL PSION UPGRADES (Vers. 2.00) of Quill Abacus Archive and Easel Unwanted spare set new and unused Will sell complete only £30 (Sinclair price £50) Tel (0865) 65164

AMSTRAD MONOCHROME MONITOR As new with boxes and eight months guarantee Plus Tasword, Arcade and Adventure games typing tutor utilities and book. Unwanted present worth £300 accept £200 Tel 01-693 8293

AMSTRAD CPC464 only 4 months old with green screen monitor Excellent condition + S/W + mags £180 Tel Lichfield 54718

DK TRONICS CHARACTER ROM on PCB for ZX81 computer Full instructions included Will spot recorded delivery if required Accept £7.50! Tel (0244) 875717

FOR SALE. Currah Speech (inc book and tape) £18 Also Valkyrie 17 (micro drive compatible) £7.50 also wanted 16K Ram pack for ZX81 will pay £10 Tel 0908 73706 after 7pm and ask for Julian

CHEETAH SWEET TALKER FOR SALE £15 boxed with instructions and demo tape hardly used For 48K Spectrum or Spectrum Plus Tel 01-906 1567

PANASONIC CASSETTE tape recorder mains/battery suitable for computer £10 in leather case or swap WHY for any Amstrad hits Cash either way Tel 893 8562

PRINTER DATA DYNAMICS 390 RS232, 110 Baud £45 ono Tel Grays Thurrock (0375) 31076

INTERFACE TWO FOR SALE Sell for £12.50 Christopher Tel (0284) 60724

AMSTRAD CPC464 colour BAsic/Firmware books Six games Joystick dust covers Cost over £450 First £300 secures Tel Guiseley (0943) 78778 or Leeds (0532) 506188 Delivery within 50 miles of Leeds

Wanted

SWAP VIC20 or any other computer tape deck 20 games joystick 17 books. Tel 01 599 9728 Steve after 4pm

SWAP 48K Spectrum cassette interface joystick, lots of games for cast iron weights barbell and dumb-bell set. 061 653 3732 or sell sell £150

WANTED printer I/O Bus s/ware manuals etc for Sharp MZ80K Phone/write 63 Springfield Road Glasgow 041 774 2008

LYNX 48K Swap my very own programs for yours Some 48K versions also available Every contact welcome as I am a lonely Swiss Lynx user Michel Moregnani Poudrières 59 2006 Neuchâtel Switzerland

SWAP I Chrome Super Tuff Burner Sky Ways wheels plus £30 cash for Spectrum 48K with leads and tape recorder Cardiff 752688

FIGARO 84 wanted to buy CBM 64 version Tel 01 387 5312

WANTED quality s/w for CBM 64 Spectrum + BBC all offers considered Bulk purchase if possible Tel 01-902 8875 after 5pm

COMMODORE VIC20 owner requires photo copying of Instructions for Commodore programmes and cartridge Payment £5 + costs of postage and photo copying Private bag 0061 Gaberone Botswana

WANTED Wico joystick Tel 051-733 0090 after 4pm

WANTED 64K MSX computer with 2 tape recorders. Must be Hitachi or Toshiba Swap for CBM 64 with tape recorder + s/w Tel 0782 24552

SWAP my Acorn Electron + original s/w for Spectrum Plus and s/w for CBM 64 + data recorder must be working order Derek 0832 851480

ESPECIALLY needed Atari soft, Thorn EMI Apple Panic 40 colour card Tel Stevenage 0438 811634 after 7pm

SPECTRUM 48K wanted will pay £35 Tel 0977 511265 after 5pm ask for Melvyn

EXCHANGE Oric I and/or Dragon 32K for Atari compatible hardware and/or software or swap both for CBM 64 Phone B ham (021) 747 3618 ask for Nigel

WANTED 48K ZX Spectrum not issue one in working order any reasonable offer considered Tel (0482) 643604 after 5pm (Tom)

SWAP Spectrum – brand new + keyboard joystick, tape recorder 15 bars s/w for CBM 64 + data recorder or sell cash Tel Paregh (0848) 35874 after 4.30pm

ADVENTURE
HELPLINE

Fantasia Diamond on Amstrad. How do you cross the river and/or open the manhole? P J Long 3 Victoria Place Rodmouster, Bristol BS3

Jewels of Babylon on Amstrad Help! I am weaponless! Where is the spear and the gun? How do you get past the octopus and the crocodile? Andrew Walton Finlow Hill Cottage Over Alderley Macclesfield Cheshire SK10

Super Spy on Spectrum Where do you go to and what do you get from London? Brian Stubbs 27 Ayresome Terrace Roundhay Leeds 8 W Yorks

Valkyrie 17 on Commodore 64 How do you use the aqualung and shaving foam, and get into the schloss? Liz O'Brian 3 Bridle Path, Madeley nr Crewe Cheshire CW3 9EL

Gremlins on Spectrum How do you kill the gremlin in the bedroom to get the flashlight? I have the sword, the camera gas bottle ladder remote control and Gizmo Symon Kendle 50 Tower Street, Treforest, Pontypridd, Mid Glamorgan, S Wales

Valhalla on Commodore 64 I can't find Ofnir K. Stirk PO Box 5548 Jeddah Saudia Arabia

Classic Adventure on Amstrad. Stuck! I have 14 items (including the pyramid) but I can't find any more rooms or treasures Linda Wright 18 Longfield Gardens Tring Herts

Castle Quest on BBC B Where is the aqualung A Hodson, Rushworth Avenue Rugeley Staffs WS15 2RR (Tel 77562)

Planet of Death on ZX81 I don't know how to kill the green man Bryan Peacock, 85 Taylor Street, Consett Co Durham

Quest on Spectrum How do you enter the castle? Nicholas Masabridge 83 Appleby Close Selwyn Estate Highams Park London E4

Forest at Worlds End on Amstrad. I cannot progress from Smiths Forge I do not know where to go and need help! Jonathon Smyth 8 Jubilee Place Lisburn Co Durham Northern Ireland (Tel Lisburn 70300)

Witches Cauldron on Spectrum. I changed into an ape opened the cupboard but am now stuck in the hall of mirrors. Stephen Emurwesn, 28 West Avenue Walthamstow London E17

Temples of Vran on Spectrum. How do I get down the cliff? Carl Brennand 4 Lyndale Grove Lostock Hall Preston Lancs PR5 5XX

Ring of Power on Commodore 64. How do I get past the lift attendant? I can't find any gold coins J E Barber 138 Oak Tree lane Selly Oak Birmingham B29

Se-Kaa of Assiah on Spectrum. How do I get the rod of light? how do I open doors? Carl Brennand 4 Lyndale Grove Lostock Hall preston, Lancs.

Time Lords on Amstrad. In Zone 3 how do I get past the Bronze? Also, how do I get past the cave men in that zone? Peter V Dequorre 28 Grenfell Street St Julians Malta.

Urangiess Aural Quest on Spectrum Where is the third part of the ear and how do I get it? Also how do I get the fourth part Dave Morris 83 Hawthorn Street Wilmslow Cheshire

Spiderman on Spdectrum. I can't defeat the mysterio or electro and I can't get the bio-gem. Neil Parsons, 158 Brindle Road Bamber Bridge Preston Lancs

Erik the Viking on Spectrum. What use are the spectacles? John Randle 24 Western Road, Aldershot Hants

Vic 20

1	(1)	S.I.P	(Mastertronic)
2	(2)	Rockman	(Mastertronic)
3	(8)	Doodlebug	(Mastertronic)
4	(7)	Space Scramble	(Mastertronic)
5	(3)	Munkey the Bunky	(Firebird)
6	(4)	Snake Bite	(Firebird)
7	(6)	Bulz Hunt	(Mastertronic)
8	(6)	Psycho Shopper	(Mastertronic)
9	(9)	New York Blitz	(Mastertronic)
10	(10)	Phantom Attack	(Mastertronic)

(Compiled by Websters Software)

Commodore 64

1	(2)	Rolands Rat Race	(Ocean)
2	(4)	Everyone's a Wally	(Mikro-Gen)
3	(1)	Gregs Revenge	(US Gold)
4	(3)	Bounty Bob	(US Gold)
5	(6)	Master of the Lamps	(Activision)
6	(—)	Gates of Dawn	(Virgin)
7	(7)	Airwolf	(Elite)
8	(8)	BMX Racers	(Mastertronic)
9	(10)	Booty	(Firebird)
10	(9)	Chiller	(Mastertronic)

(Compiled by Websters Software)

Spectrum

1	(2)	Confuzion	(Incentive)
2	(1)	Booty	(Firebird)
3	(4)	Airwolf	(Elite)
4	(6)	Bruce Lee	(US Gold)
5	(5)	Raid over Moscow	(US Gold)
6	(3)	Gyron	(Firebird)
7	(9)	Sorcery	(Melbourne House)
8	(7)	Finders Keepers	(Mastertronic)
9	(—)	Nome Crease	(Incentive)
10	(—)	Wizard Warrior	(Mastertronic)

(Compiled by Websters Software)

BBC B

1	(1)	Elite	(Acornsoft)
2	(—)	Wilcesanre	(Imagine)
3	(—)	Vicon	(CSM)
4	(2)	Snooker	(Acornsoft)
5	(8)	Castle Quest	(Micropower)
6	(—)	Elite (Disc)	(Acornsoft)
7	(—)	Challenger	(Mastertronic)
8	(3)	Mini Office	(Database Pub)
9	(5)	Duck	(Firebird)
10	(—)	Mr EE	(Micropower)

(Compiled by Websters Software)

Atari

1	(5)	House Hits 1	(English)
2	(3)	Spoken Ace	(US Gold)
3	(4)	Mr Do	(US Gold)
4	(1)	Bruce Lee	(US Gold)
5	(8)	Fort Apocalypse	(US Gold)
6	(9)	Attack of Mutant Camels	(Llamasoft)
7	(9)	Smash Hits 2	(English)
8	(—)	F15/Strike Eagle	(US Gold)
9	(2)	Blue Max	(US Gold)
10	(—)	Zaxxon	(US Gold)

(Compiled by Websters Software)

C 16

1	(8)	Vegas Jackpot	(Mastertronic)
2	(—)	Exorcist	(CBM)
3	(7)	Classic Adventure	(Melbourne House)
4	(—)	Games Tape 2	(Melbourne House)
5	(6)	Scramble	(Anirog)
6	(—)	Games Tape 1	(Melbourne House)
7	(—)	Stellar Wars/Wars	(CBM)
8	(—)	Crazy Golf	(CBM)
9	(4)	Williamsburg Adv	(Microdeal)
10	(1)	Wizard & Princess	(Melbourne House)

(Compiled by Websters Software)

Electron

1	(5)	Mini Office	(Database Pub)
2	(1)	Football Manager	(Addictive)
3	(—)	Elite	(Acornsoft)
4	(6)	Classic Adventure	(Melbourne House)
5	(10)	Overdrive	(Superior Soft)
6	(5)	Chuckie Egg	(A&F)
7	(8)	The Hacker	(Firebird)
8	(—)	Bird Strike	(Firebird)
9	(3)	Chorls	(Micropower)
10	(7)	Dare Devil Dennis	(Visions)

(Compiled by Websters Software)

Amstrad

1	(2)	Fighter Pilot	(Digital Integration)
2	(—)	Decathlon	(Ocean)
3	(—)	Sir Lancelot	(Melbourne House)
4	(—)	Combat Lynx	(Durell)
5	(—)	Fruity Frank	(Kuma)
6	(1)	Sorcery	(Virgin)
7	(7)	Dark Star	(Design Design)
8	(—)	Snooker (S. Davis)	(CDS)
9	(—)	Confuzion	(Incentive)
10	(3)	Jet Set Willy	(Software Projects)

(Compiled by Websters Software)

Event	Dates	Venue	Admission	Organisers
Computer New	May 26th 10.30am – 7.00pm	Saracens Hall 18 Swindon Rd Cheltenham	30p	CJS Ltd Northleach 6??
6th Commodore Computer Show	June 7-8 10.00am – 6.00pm June 9 10.00am – 5.00pm	Novotel London W6	£2.00 adults £1.00 children	B + CS Marketing Ltd 01-??? 0198
Microfair	June 22 10.00am – 6.00pm	New Horticultural Hall Greycoat St London SW1	£1.00 adults £1.00 children	Mike Johnson 01-801 8172
Third Official Acorn User Exhibition	July 20 Trade: 10.00am 1.00pm July 20 – 28	Barbican Centre London EC2	£3 adults £2 children	Computer Marketplace (Exhibitions) Ltd 01 930 1612

Readers' Chart No 25

1	(1)	Soft Aid *(Spectrum/C64)*	**Various Artists**
2=	(2)	Everyone's a Wally *(Spectrum/C64)*	**Mikro-Gen**
=	(3)	Alien 8 *(Spectrum)*	**Ultimate**
4	(4)	Knight Lore *(Spectrum/BBC/Amstrad)*	**Ultimate**
5	(8)	Sorcery *(C64/Amstrad)*	**Virgin**
6	(7)	Bruce Lee *(Spectrum/C64)*	**US Gold**
7	(5)	Match Day *(Spectrum)*	**Ocean**
8	(6)	Tir Na Nog *(Spectrum/C64)*	**Gargoyle**
9	(10)	Finders Keepers *(Spectrum/Amstrad)*	**Mastertronic**
10	(-)	Confuzion *(Spectrum/Amstrad)*	**Incentive**

Winning phrase No 25. "Everton lose 5 nil" from Paul Drage of Forest Gate, London E7, who receives £25 Others who came close were "Only stew live eels on a Friday" from T. Surdis of London SW14, "55 fail to Alien 8 VE day Ron" from Jeff Peires of London WC1, "Tears on VE day" from Donaldson of Dunblane, Perthshire, "Sally only ever dines at 8" from Simon Kitchen of Doncaster and "I nee a f w ad-s--onal let-ers" from Iain Gibson of Clydebank

Now voting on week 27 – £25 to win

Each week *Popular* is compiling its own special software top ten chart – compiled by YOU.

And each week we will send £25 to the person who sends in, with their chart votes, the most original (witty, neat or clever – but never rude) phrase or sentence made up from the letters (you don't have to use them all) in the titles of the top three programs in this week's chart, published above.

You can still vote in the chart without making up a slogan – but you won't be in with a chance of winning the prize

All you have to do is fill in the form below (or copy it out if you don't want to damage your magazine) and send it off to. Top 10, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

Voting for Week 27 closes at 2pm on Wednesday May 29 1985 Entries received after that time will not be eligible for inclusion in that week's voting. The judges decision is final. Only one entry per individual per week will be allowed

Name .... **My top 3: Voting Week 27**

Address .... 1..

.... 2..

.... 3..

My phrase is: ....

New Releases

UNPLEASANT

You coultin't, in all honesty, say that New Generation's latest Commodore 64 game is all that original

Amazon Warrior is basically *Aztec Forest*, the US game licensed by Audiogenic in this country

The task is to kill your way through the jungle to a ruined temple where all sorts of unpleasant things await you Being an uncivilised native your only weapon is a blow-pipe which has to be reloaded after each blow – this takes time and leaves you at the mercy of various unpleasant jungle creatures that want to eat you.

And so on. Basically that's it – load quickly and be accurate in your use of blowpipe.

Points in the game's favour are some nicely atmospheric Tony Crowtherish backgrounds and some excellent music Not a vital purchase though

Program *Amazon Warrior*
Price *£7 95*
Micro *Commodore 64*
Supplier *New Generation, The Brooklands, Sunnybank, Lyncombe Vale, Dorset*

REASONABLE

If you think of *Charlie and the Chocolate Factory*, not as anything dramatically wonderful or original, but as five reasonable arcade games for £9 95 it's rather good

This package is loosely related to the famous book by Roald Dahl and for £9 95 you get a copy of the book thrown in. There are four single-screen games of various kinds, *Augustus Gloop* is a sort of sliding-block puzzle, *Veruca Salt* is a dodge game as is *Violet Beauregarde* and *Mike Reavee* is a platform/collect game

There is a multi-screen *Miner*-style affair on the other side of the tape where you try to get through the machines of the chocolate factory and collect six golden keys

Not as good as *Miner*, but it's OK and is a reasonable way of getting a number of competent arcade games very cheaply

Program *Charlie and the Chocolate Factory*
Price *£9 95*
Micro *Spectrum*
Supplier *Hill MacGibbon, 8 Grafton Street, London W1X 3LA*

MAGAZINE

There are still a few magazines on tape around although generally they don't seem to be doing all that well. One of the best is published by Infinite Software, who also do a number of machine code utilities and similar programs for the Spectrum

The magazine is simply called the *Microsoftware Magazine* and whilst the packaging isn't all that staggering, the actual tape is very well presented There is much use of machine code routines for large letters, clever scrolls, fades, outs and colour changes – it looks good

On Vol 2 No 2 there is a nicely done, if simple, biorhythm program, a crossword, two games, sections on Basic and machine code, reviews, letters and a section on cheating on games.

At £2 99 it's expensive if you simply compare it section for section with a magazine but then that's not the point – it does things no magazine could do and it does them pretty well.

For me, it's probably an expensive luxury but if you want a Spectrum tape magazine this is certainly the best I've seen

Program *Microsoftware Magazine*
Price *£2 99*
Micro *Spectrum*
Supplier *Infinite Software, 73 Alcester Road, Moseley, Birmingham 13*

FREE THROW

International Soccer for the Commodore 64 is still a lot of people's favourite computer game ever.

Those big sprites and authentic playing styles still haven't been surpassed

Now two years later Commodore offers the follow up *International Basketball* Although the number of players and playing area are considerably reduced when compared to *Soccer*, the graphics are even better, finely detailed with accurate running and jumping styles (actually there's something about the jump – a certain heavyness – that makes it look faintly funny but personally I love it)

The playing system is the same as *International Soccer* The nearest figure to the ball is highlighted and once selected comes under joystick control Fire initiates a jump for the basket.

The players run at different speeds according to what they are doing: chasing, dribbling, etc, and the computer automatically sets up free shots or throw ins as required.

An excellent game, although in this country maybe basketball isn't as glamorous as football and sales may be correspondingly less

There's one particularly bizarre fact though. *International Soccer* was on cartridge for nearly £20 This game is better and on cassette for a staggeringly low £5 99

All the more reason to go out and buy it immediately Since Commodore seem to pick their prices out of a hat it might be £15 or more tomorrow

Program *International Basketball*
Price *£5 99*
Micro *Commodore 64*
Supplier *Commodore, Hunter Road, Weldon North, Industrial Estate, Corby, Northants*

This Week

Program	*Type*	*Micro*	*Price*	*Supplier*
Warlord	Adv	Amstrad	£8 64	Interceptor
Mr Freeze	Arc	Amstrad	£2.50	Firebird
Short's Fuse	Arc	Amstrad	£2.64	Amstrad
Subsunk	Arc	Amstrad	£2.64	Firebird
Super Pipeline	Arc	Amstrad	£2.90	Task Set
The Wild Bunch	Arc	Amstrad	£2.64	Firebird
Contraption	Arc	BBC B	£5 95	Icon Software
Microcosm	Arc	BBC B	£2.90	Firebird
Mr Freeze	Arc	BBC B	£2.60	Firebird
Flip	Arc	BBC B	£7 95	Icon Software
Intro Geography	Ed	BBC B	£20 04	BBC Publication
M/C for Beginners	Ed	BBC B	£8 64	Dream Soft
Reva	S	BBC B	£14.95	Acornsoft
Profile	Ut	BBC B	£12 00	Clares Micro
Jewels of Babylon	Adv	Commodore 64	£7 00	Interceptor
Chicken Chase	Arc	Commodore 64	£2.50	Firebird
Circus Circus	Arc	Commodore 64	£2.50	Firebird
Extra	Arc	Commodore 64	£2.50	Firebird
International B/Ball	Arc	Commodore 64	£5.99	Commodore
Subsunk	Arc	Commodore 64	£2.50	Firebird
The Helm	Arc	Commodore 64	£2.50	Firebird

New Releases

BOUNCERS

Dambusters is US Gold's summer biggy

Their sure-fire number one that's getting all the promotion money spent on it. It even has the benefit of riding the back of a certain amount of post VE Day gung-ho patriotism And, it is going to sell by the truck load.

Dambusters is more than a flight simulation and more than a dogfight blast 'em down game Instead it's as realistic a presentation of the actual raid on those nasty German dams as anyone could hope for on, to begin with, the Commodore 64

The actual aircraft is divided into various sections, cockpit, bomb bay, tail gunner, front gunner etc Each has it's own detailed screen display toggled by single-key presses The graphics are full of detail – not just the necessary instruments but also the bolts, shadows and correct perspective are featured

In previous flight simulations different keys have been assigned to different controls f flaps, b = brakes etc, meaning either to remember or some sort of keyboard overlay

In *Dambusters* offer a far more elegant and easier solution – a dot which you shift from control to control on the screen until you have the one you want, then set keys for either more and less of whatever control it is

The screen displays not only instrument readings but also the world outside Backgrounds are generally fairly simple but the 3D works well

Considerably more spectacular are the barrage balloons and ME109s you'll meet along the way – these grow in size as they approach to give the illusion of distance

So you have to pilot this plane dodging the might of the German airforce, flak and searchlights that will mark you out if you don't avoid the beam – that would be enough in itself. Except that the whole point is to reach the dam and drop your bouncing bomb at the right moment to blow it to bits Dropping the bomb requires as much skill as flying the plane.

Dambusters is a simulation with everything and it's first class The only problem is the constant one with accurate simulations – it might be too difficult for the average player

Program *Dambusters*
Price *£14.95 (disc)*
£9 95 (cassette)
Micro *Commodore 64*
Supplier *US Gold*
Unit 10
The Parkway
Industrial Centre
Heneage St
Birmingham

PRE-PAYED

The *Transact* book-keeping system is another independent piece of QL software It is happening but too little too late?

Anyway, *Transact* is good, a book keeping system which allows 100 accounts to be filled under ten section headings including, bank, cash, debtor, creditor and VAT controls

Other accounts features include two accounts just for accrual and prepayment adjustments, 90 other account headings can be adjusted. Balances can be fully up-dated using balances and section totals

Transaction files simulate manual books of prime entry sales, purchases, bank and petty cash transactions. VAT is worked out automatically and the whole thing is done in authentic double entry The screen display is neat and clear Putting in silly amounts, dates, etc, doesn't crash it – in short it is idiot proofed.

You do need to understand accounting though. I don't

Program *Transact*
Price *£34 95*
Micro *QL*
Supplier *Dialog Software*
20 New Row
London WC2N 4LA

STANDARD

If this is what Kissin' Kousins do, no wonder God invented glandular fever

Perhaps I'm being overly down on this game – after all, it's not its fault I decided to load it into the brand, sparkling new Atari 130XE that appeared in our office last week.

Nor is it its fault that soon afterwards five discs full of the latest American Atari software also happened to turn up

What I'm trying to say is – I didn't like it, in fact, I hated it.

Graphically it just didn't come anyway near even the worst of the US Atari games Colourful it may be, but artistic – or even attractive items under the heading of – it isn't

As for gameplay, it's all jump and shoot, avoiding the dustbins, walking over the geraniums when in flower, dodging the kangaroo . . fairly standard stuff, in other words

Program *Kissin' Kousins*
Price *£6 95*
Micro *Atari*
Supplier *English Software*
3rd Floor
1 North Parade
Parsonage
Gardens
Manchester
M60 1BX

GRUESOME

Pete 'n' Barry is an impersonation of *Atic Atac* that isn't as good but does only cost £4.95 It may also be the most gruesome game you've ever seen.

The plot involves you as a policeman PC Plod (inventive eh?) trying to rescue a female reporter (ah, those poor helpless women) who is held captive by a bunch of weirdos in a building of 1000 rooms

These are square with doors that open and shut and large numbers of sprites that can be attacked with your truncheon.

This Week

Dambusters	Arc	Commodore 64	£9 95	Us Gold
Crystals of Carus	Adv	Commodore 64	£7 00	Interceptor
Bird Strike	Arc	Electron	£2 50	Firebird
Caveman	Arc	Electron	£7 95	Icon Software
The Hacker	Arc	Electron	£2 50	Firebird
E.V.A.	Arc	QL	£10 95	Westway
QL Zapper	Arc	QL	£14 50	Eidersoft
The Helm	Ad	Spectrum	£2.50	Firebird
Don t Panic	Arc	Spectrum	£2.50	Firebird
Warlord	Adv	Spectrum	£5.50	Interceptor
Arabian Nights	Arc	Spectrum	£6 00	Interceptor
Don't Buy This	Arc	Spectrum	£2.50	Firebird
Fahrenheit 3000	Arc	Spectrum	£2.50	Firebird
Frankenstein 2000	Arc	Spectrum	£6 95	Icon Software
Helichopper	Arc	Spectrum	£2.50	Firebird
Short a Fuse	Arc	Spectrum	£2.50	Firebird
Super Pipeline II	Arc	Spectrum	£7 95	Task Set
Subsunk	Adv	Spectrum	£2.50	Firebird

Key: Ad – adventure
Arc – arcade
Ed – education
S strategy-simulation
Ut – Utility

New Releases

Pick of the week

SPEED KING

At this, late, stage in its history the BBC B is finally getting some decent software

After the magnificent *Elite* we now have another winner – *Revs*.

This is a racing car simulation in which you drive around the circuit of Silverstone battling it out in an authentic 3D representation of the track. There are options to practice the course alone and the manual gives you vital clues on getting around the track.

The point about *Revs* when compared to something like *Pole Position* which superficially looks the same is that you really have to drive the car This means that there are a number of keys to control the car brake, throttle, gears up, gears down, steer left, steer right, and more

At the beginning, for example, the car sits there motionless until you realise you have to start it The advantage of having such a realistic simulation is that you can do things like drive off the track and not necessarily be destroyed. The disadvantage is that you have to invest a lot of effort into the game before it really starts paying dividends

Graphically it is excellent, backgrounds are kept pretty simple so the scrolling is smooth and effective, the instrumentation graphics are detailed enough for you to read the current values. The whole car handling, track structure and race details are so accurate that you can even alter things like the front wing and rear wing angles – the track is represented down to correct gradients and dips It feels like driving a real racing car and as such must be one of the best simulations ever

You'll need a lot of practice though

Program *Revs*
Price *£14 95 (Tape)*
Micro *BBC*
Supplier *Acornsoft*
Betjeman House
104 Hills Road
Cambridge

Some of the rooms may only be entered if you have found certain objects, eg, the video to go with video machine And here and there you must replenish your energy which sinks as you are battered by nasties.

To rescue the reporter you must find the various parts of a doll which when assembled may be used as a trade in for the reporter These are littered around with various rooms, as are pools of blood and gore and dead bodies If you fail in your mission a hand comes down and rips your head off – no compromise in this game.

It's quite good fun but is the programming technology of over a year ago, colour clashes and all

Personally I'd rate it as good value at a budget £2 50 sort of price, at £4 95 I still don't think it's cheap enough to get more than a hhmmmm, well.

Program *Pete 'n' Barry*
Price *£4 95*
Micro *Spectrum*
Supplier *Impact Software*
2 New Street
Cullompton
Devon EX15 1HA

ALIGN AWAY

Interceptor were the first to show just how impressive graphics on the Amstrad could be

Now they have done more for the machine in the form of the *Azimuth Adjustment Kit* which sounds boring but isn't!

The problem with the Amstrad is that the tape deck, whilst reasonably reliable, is an integral part of the whole unit

Tape machines are fairly prone to getting our of alignment – this problem, whilst not major, is enough to prevent tapes from loading

Ordinarily this would mean that nothing could be done but return the whole machine for repair Interceptor have changed all that with one of the most practical utilities I've ever seen.

The *Azimuth Adjustment Kit* is a program that lets you set your tape deck heads perfectly (they can be adjusted using a simple screwdriver which is provided) It s child play and could save you a vast amount of misery and irritation.

You even get an OKish game on the back with which to check your new found perfectly adjusted Amstrad

Program *Azimuth Adjustment Kit*
Price *£8 99*
Micro *Amstrad*
Supplier *Interceptor Micro's*
Lindon House
The Green
Tadley

Compiled by Graham Tayler

New Releases is designed to let people know what software is coming on the market If you have a new game or utility which you are about to release send a copy and accompanying details to New Releases, *Popular Computing Weekly* 12-13 Little Newport Street, London WC2R 3LD.

This Week

Acornsoft Betjeman House, 104 Hills Rd Cambridge CB2 1LQ, 0223 316039 **Amstrad,** 169 Kings Road Brentwood, Essex **BBC Publication** PO Box 234, 144-152 Bermondsey Street London SE1 3TH **Clares Micro** 98 Middlewich Road Rudheath Northwich, Cheshire **Commodore,** 1 Hunters Road Weldon North Industrial Est. Weldon Corby NN17 1QY **Dream Soft** PO Box 64 Basingstoke RG21 2LB **Elderaoft** Hall Farm, North Ockendon Upminster Essex 01-478 1291 **Firebird** Wellington House Upper St Martins Lane London WC2H 9DL **Icon Software** 65 High Street Gosforth Tyne & Wear **Interceptor Micro's,** Lindon House, The Green Tadley Hampshire **Task Set** 13 High Street Bridlington, YO16 4PR 0262 673798 **US Gold** Unit 10 The Parkway Ind Centre Heneage Street Birmingham B7 021-359 3020 **Westway,** 24 Preston Road Lytham, Lancashire FY8 5AA



Correcting errors

Errors benefit us because they lead us
to study what happened,
to understand what went wrong, and,
through understanding,
to fix it.

Seymour Papert, **Mindstorms**

There is an old proverb which says: "To err is human to forgive is divine".

Think, however, how often we have been taught that mistakes are bad, and if one makes a mistake it should be obliterated, or ignored and never examined. The other old proverb ("We learn from our mistakes") is largely ignored.

When I was taught mathematics at secondary school, my 'A' level teacher made me write everything in the one book so that – if a mistake was made and I realised there was a mistake – a mistake was simply crossed out. By my admission of the error and by leaving the error legible but corrected, she could see the ways in which I had tried to solve the problem. She did not believe in instant perfection.

I was lucky, in that my teacher was enlightened enough to realise that it was possible to learn from one's mistakes Just as importantly, she was sufficiently positive in that conviction to try to encourage learning from mistakes I learnt a good deal about the strategy of solving problems from that teacher, in addition to the tactics of problem solving beloved of maths teachers

Nowadays in schools, one of the essential ingredients of any school bag is the bottle of white obliterating fluid, once used only by typists

Any mistake is immediately painted over: that the piece of work is an intellectual shambles seems to be irrelevant

In the dim past the equivalent to the white fluid was the bleach used to sanitise babies' feeding bottles.

I remember my teacher s outrage at the use of such a deception. Interestingly the most consistent manipulator of the bleach bottle was one of the most mundane and unimaginative of my fellows To learn from one's mistakes was rather too esoteric a point for him to grasp

The mindless concern of the mindless with the (unconvincing) pretence of perfection even sullies examinations.

Looking round the assembled collection of students scribbling away one sees desks with writing instruments, sweets, drinks and bottles of correction fluid. Purely from observation, there seems to be a strong correlation between lack of imagination and use of the white balm.

Some examinees are so concerned with not appearing to have erred that – during the examination they will stop paint out the mistake let the paint dry, and then make their corrections

A line through the words, and then something written (neatly) above is as acceptable, and certainly a much quicker way in an examination – where time is taken to be at a premium.

I know I do talk a lot about Logo but it is always useful to look at other approaches to problems – and Basic is by no means perfect.

Logo is interesting because it is a computer language which accepts that errors will be made and which has been designed to help the user to learn from those errors

If a person is to learn from the mistakes that he or she made, then the information provided to that person – if and when mistakes are made should be as constructively helpful as possible

The emphasis on constructive help is important to Logo, because one hopes that, in time, the errors will become fewer and the topics tackled will be more demanding.

It does not help us the slightest to be told you are wrong – you also need to know why

Boris Allan

Figured out

Puzzle No 198

Jake and Hank are two old-timers who live next to one another on Peartreee Boulevard.

Jake is very keen at figuring and he found that the product of their two addresses could be said to equal PEARTREE For example, if the street numbers were 7933 and 7934 (they differ by just one) then the product would be 62940422 If that is compared with the word PEARTREE it can be seen that like digits correspond to like letters

PEARTREE
62940422

However, in the case of Jake and Hank, all the digits in their addresses are also to be found in the product, which is not the case in the example given (there is no 7 or 3 in the product) What are their addresses

Solution to Puzzle No 194

The number of steps needed in each case is. 1980-8 1981-3 1982-18 1983-5, 1984-14 1985-7, 1986-7 1987-1 1988-11, 1989-10, 1990-20

```
10 INPUT N
20 LET Z=N:LET T=1:LET C=0
30 GOSUB 90
40 LET C=C+1
50 PRINT C T
60 IF T=1 THEN GOTO 140
70 LET Z=T LET T=1
80 GOTO 30
90 LET K=SQR(Z):LET K=VAL(STR$(K))
100 FOR F=2 TO K
110 IF Z/F=INT(Z/F)THEN LET T=T+Z/F:LET T=T+(Z/(Z/F))
120 NEXT F
130 RETURN
140 PRINT:PRINT N;" RESOLVES IN ";C;"STEPS"
150 GOTO 10
```

Note that the number 1987 being prime reduces in only one step, and that the value 1988 appears to increase without limit. There is also the possibility that the sums of divisors might eventually, after many stages, reduce to the original value (1988) in this case the process would be repeated endlessly

The program calculates the sum of all the aliquot divisors, continuing until the value of 1 is reached

Winners of Puzzle 154

The winner is James Lucy of Great Totham, Maldon, Essex, CM8 8DF, who receives £10

Rules

The closing date for Puzzle No 198 is June 18

The Hackers